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THE LATE KING

SO soon after we had given expression in our columns on behalf of the profession to our gratitude and joy at the completion of the twenty-fifth year of his reign, the news has spread among the British peoples and throughout the world of the death of His Majesty King George V. At this moment of universal sorrow and mourning we are first moved to tender our heartfelt sympathy to Her Majesty Queen Mary and the other members of the Royal Family in their sad bereavement. We pay dutiful homage to the new king, King Edward VIII. In extending, on behalf of the profession, our condolences, we are moved again to recollect vividly the essential truth underlying what we had written on the former occasion, that in any estimate of the progress we have been able to record during his reign, we shall always have to recognise the paramount influence of the late King as the Sovereign and the man who, above all, throughout a period of unprecedented anxiety for his peoples, inspired among them enduring confidence and trust. We can now say, with the rest of his sorrowing subjects, that we mourn the passing of a great king and a good and beloved man.

General Article

EPIZOOTIC COUGH IN HORSES: EQUINE INFECTIOUS BRONCHITIS*

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I.—Definition and Import

Epizoötic cough in horses is a highly contagious respiratory disease, characterised clinically by a dry, strong cough as its chief symptom and pathologically by lesions of bronchitis and peribronchitis. The disease was carefully described as long ago as 1888 by Zorn[15] and again more recently by Dr. Pape, veterinary surgeon to the Union Turf Club. According to the descriptions given it assumes from time to time the characteristics of an epizoötic disease and attacks with especial frequency thoroughbred horses in the training establishments of all countries. Numerous investigations have been carried out upon it, both before and after the War; these have not succeeded, however, in throwing any light upon its nature. The disease, moreover, is not designated universally by the same name. In Germany it is called "Hoppegarten Cough" in racing circles,[10] "Infectious Catarrh of the Air-passages" in the Army,[6] "Epizoötic Laryngo-tracheal Catarrh" in country horse-breeding districts,[15] and also in older writings "Skalma" (Dieckerhoff[2]).

Investigations upon the ætiology of the disease were begun by the present writers in the autumn of 1935.‡ The spread of the disease among the racing stables at Hoppegarten [a racing centre near Berlin] presented opportunities for its study.§ The researches undertaken aimed at discovering the causal agent of the disease and gaining some insight into its pathogenesis. For reasons which are set forth in Section VIII the name chosen to designate the disease uniformly in this paper is "Epizoötic Cough in Horses."

II.—Lesions of the Disease

If a horse is killed on the second or third day after the onset of recognisable clinical symptoms, that is, after an attack of coughing has begun, the only changes that can be traced in the body tissues are to be found in the lungs. The mucosa lining the nasal passages, larynx, and trachea shows no abnormality. Evidence of disease changes may be found in all parts of the lungs, which disclose a stringy, shiny, yellowish exudate inside all the bronchial tubes, even the smallest branches. This exudate is sometimes rather frothy. There may also be found some mucinous shreds upon the tracheal mucosa which would seem to have been expelled upwards from the bronchi. If one examines a section that has been cut across only one portion of the lung one may fail to detect in it the above changes, and one may often succeed in finding them only in a very small portion of the lung tissue. The bronchial lymphatic glands are always enlarged and very moist on section. The other organs of the body show no abnormality.

Histologically, the lung lesions are found to consist of a bronchitis and peribronchitis. These features have been minutely depicted by Dr. Schmidt in another paper. Histological changes of the same kind had been recorded previously by Schürmann[11] (1933).

EXPERIMENTAL OBSERVATIONS

III.—Transmission of the Disease

1.—*By Contact*

From the published results of former investigations, it had not been established decisively that epizoötic cough in horses was essentially of the nature of an infectious disease. It had been found that the disease could not be reproduced artificially by inoculation with the streptococci isolated from the nasal secretions and the lungs [Möllmann,[9] Bongert (in correspondence)]. Dust, sand particles, cold winds and fogs had been blamed for giving rise to the disease and were held to explain the occurrence of outbreaks (Frese[3]). The first objective of the present researches begun in Hoppegarten was therefore to determine whether the disease is spread by contact. For this purpose, a healthy thoroughbred yearling was placed among the coughing horses of a racing stable, and it was found that on the third day after admission it began to show typical symptoms of the disease. These typical symptoms are, first, a slight reddening of the nasal mucosa and conjunctiva, accompanied by a well-marked serous discharge from the nose and eyes. At

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* Translated from *Zentralblatt für Bakteriologie, I* Abt., Originale, 1934-35. 133. 49-59. Reproduced by kind permission of the authors, editors and publishers, which must be obtained if further reproduction in English, in whole or in part, is desired.

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‡ Materials for investigation were obtained from the Prussian Veterinary Service, the principal authorities concerned with horse racing, breeding organisations, and the veterinary inspectorate at the *Reichswehr* ministry.

§ A preliminary report on these studies was published in *Berliner tierärztliche Wochenschrift.* 1934. 1. [This report was translated in *The Veterinary Record,* 1934, No. 11, p. 277.]

this time, a slight degree of swelling of the lymphatic glands in the throat can be felt, which soon subsides and is rather painful. On the second or third day after first exposure the rectal temperature rises to 102° to 105°F. At this stage, shivering fits set in, breathing is accelerated, and the animals look dull and sometimes refuse food. These symptoms last only a few hours—at longest, twelve hours—and escape detection altogether if the animals are not kept under close observation. There is heard now or a little later a hollow, hard, and seemingly painful cough, which from now on becomes the only noticeable symptom. Only a very small quantity of dried-up exudate is seen to persist in the nostrils and on the eyes, and usually the animals feed well and are lively in appearance. Spread of the disease through contact succeeded with two more experimental horses. It was therefore concluded that the condition under investigation could be treated in further work as an infectious disease.

The three horses used in these contact experiments were killed. The changes found in the lungs were identical with those described above, in Section II. No abnormalities were seen in any other organs.

2.—*Transmission by means of a Cotton-wool Filtrate*

It seemed from the localisation of the lesions in the above horses infected by contact that the causal agent of the disease ought to be demonstrated in the lung tissue. From this tissue there was prepared accordingly what is called here a cotton-wool filtrate. The lungs were minced up finely in a sterile mincing machine and the mush thoroughly shaken up with an equal volume of physiological salt solution. The tissue juice was separated from the coarse solid matter by filtering the mixture through sterile fat-free cotton-wool in a glass funnel with gentle suction from a water pump. The fluid obtained in this way is referred to as a cotton-wool filtrate, and a search was made for the infective agent which ought presumably to be present in it. Healthy experimental horses were artificially infected with this cotton-wool filtrate in the following manner. A length of narrow rubber tubing, 18 inches long, with a blunted end, was inserted to about half its length within the lower nasal passages, on the right or left side, of thoroughbred or non-thoroughbred colts, between one and two years old. About 50 c.c. of the cotton-wool filtrate was injected through the tube applying very slight pressure. In this way some of the fluid flowed onwards through the nasal passages and some of it escaped backwards out of the nostrils. The actual quantity of fluid which remained upon the nasal mucosa or Schneiderian membrane would really represent only a small fraction of the total dose injected; hence the cotton-wool filtrate might be sprayed into the nostrils as an alternative method of experimental infection. A third portion of the fluid injected would be swallowed. None entered the trachea. In one case where some happened to reach the trachea, the horse under experiment coughed violently. The sites therefore from which artificial infection could originate would consist of the mucosa of the lower nasal passages, pharynx situated dorsal to the palate, and digestive tract. No evidence was obtained that the mucosa of the digestive tract acted as a portal of entry for the virus.

With the above cotton-wool filtrate obtained from diseased lung tissue, six horses were infected successfully in the course of two serial transfers, three horses being used in each "passage" experiment, with an average incubation period of seven days. The symptoms observed were identical with those seen in naturally infected animals. The only striking difference was that the incubation period was distinctly longer than had been observed in numerous cases of the natural disease.

No bacterial invaders were discoverable in the lungs of the horses that were killed after infection with the cotton-wool filtrate, or of those infected by contact, on microscopic examination or on culture media. These media comprised solid media containing fresh blood and heated blood, and Drigalski plates, and a liquid medium consisting of glucose broth, incubated ærobically. These findings therefore produced a strong impression that the causal agent must be a filtrable virus.

3.—*Demonstration of a Virus*

The next step was to determine whether horses could be infected when bacteria-free filtrates were used for inoculation by a method such as that described above. Cotton-wool filtrate prepared from diseased lung tissue of artificially infected horses was passed through a Seitz E.K. filter so as to get rid of any contaminating bacteria and then tested upon the culture media already mentioned to obtain confirmation that no bacteria remained in it. Healthy colts were successfully infected with this material. For this critical experiment very special precautions were taken in the stabling of the experimental animals. The stabling was provided in strict isolation on the Island of Riems, and it had never been occupied previously by horses. In two sets of experiments the disease was transmitted readily through four serial transfers by means of this bacteria-free filtrate.

The causal agent of epizoötic cough in horses was therefore concluded to be a virus.

Whereas the period of incubation after

natural infection was usually only two or three days, the time which elapsed before the animals that had been infected artificially, whether with cotton-wool filtrate or bacteria-free filtrate, began to cough extended on an average to seven days. It is believed that this discrepancy is attributable to differences between the modes of entry of the virus into the body in the natural and artificial infections. The present writers are inclined to accept the view expressed by B. Lange[7] to explain the short duration of the incubation period in cases of contact infection; this author believes that the infective droplets coughed up by subjects suffering from acute infectious diseases may be inhaled directly into the lungs of healthy animals that are exposed to infection and that the causal agents are then in a position to produce the specific lesions of the disease at the site of arrest. The much longer period of incubation observed after artificial infection, on the other hand, suggests that the virus has to pass through a stage of preliminary multiplication within the upper respiratory tract, close to the nostrils, before it can develop in the predilection site for lesions, namely, the lungs. During the transient rise in temperature, which either synchronises with or precedes the onset of coughing, the virus was demonstrated in one experiment, which was undertaken to throw light on this question, to be present in the blood. It would seem, therefore, that when an animal is infected artificially the virus enters the blood after multiplication in the nasal passages and reaches the lungs from the blood.

IV.—Properties of the Virus

1.—*Survival Outside the Animal Body*

The temperature chosen for conservation of the virus was −2°C. Test tubes (about 2 in. diam.) were filled with fragments of lung tissue, about the size of walnuts, excised from affected horses. The tubes were closed with rubber caps and covered with a layer of paraffin. They were then frozen in a refrigerator at −2°C. The results so far obtained show that the virus remains active for at least 23 days at this temperature. More experiments to determine the period of survival need to be carried out.

The virus does not seem to withstand drying very well. In one experiment fragments of lung tissue were first frozen overnight in a freezing mixture, the juice expressed on thawing was then centrifuged and the supernatant fluid dried *in vacuo* over concentrated sulphuric acid. The dried powder obtained was then triturated with physiological salt solution and inoculated intranasally into a horse. This animal afterwards showed no symptom, and was proved susceptible to infection later on retest with fresh material.

2.—*Resistance against Disinfection*

The boxes in a stable which had accommodated two horses that had fallen ill after infection were thoroughly cleansed and sprayed with a 2 per cent. soda solution. A two-year-old colt was then placed in the stable for three weeks. It showed no sign of disease afterwards and was then proved on retest to be susceptible to infection.

3.—*Part Played by Human Agencies in Transmission*

For the numerous experiments which were conducted simultaneously upon the ætiology of the epizoötic cough, the animals employed were rigorously segregated in isolation sheds. The animals in each experiment were looked after and kept under observation by a separate attendant. They were examined daily, however, by one and the same person. Each stable attendant was provided with a separate pair of gummed boots and wore a special overall and also cleansed his hands with soap and water. By adopting these measures there never occurred any accidental spread of infection to the healthy horses.

V.—Secondary Bacterial Invaders

1.—*Clinical Symptoms*

The above experiments had shown that the epizoötic cough (or infectious bronchitis) caused by the virus was an infectious disease which was characterised by well-defined symptoms and lesions and ran its course within two to three weeks. Some cases, however, came under observation in which fever recurred several times at irregular intervals, when the temperature often rose to 106°F. The attack of coughing persisted for several weeks, the animal went off its feed, and a muco-purulent discharge from the nose and eyes was seen. On auscultation of the chest, high-pitched vesicular breathing and crepitus could be heard. These complications arose especially when horses were not given rest and attention after the beginning of an outbreak of the virus disease but were continued at hard work. These cases recovered again without curative treatment when the precaution was taken to rest the animals from work.

2.—Post-mortem *Lesions*

To elucidate the nature of the pathological changes taking place in the lungs which gave rise to the complications in the disease, several animals were killed for examination at varying intervals after both natural and artificial infection. Table No. 1 (see p. 83) gives a list of all horses examined. The list is divided into three groups, namely (i) spontaneously infected animals; (ii) animals artificially infected with cotton-wool filtrate; (iii) animals similarly infected with bacteria-free filtrate.

Table No. I.

Serial No.	Horse.	Mode of Infection.	Interval between Dates of Infection and Slaughter.	Lesions found *post mortem* in Lungs.	Bacteria found in in Lungs.
1	*I* 1	Natural	Unknown	Pneumonia in numerous lobules	Hæmolytic streptococci
2	*I* 2	„	2 days after first symptoms	Mucous exudate in bronchi. Otherwise no abnormality	Sterile
3	*I* 9	„	4 days	Same as above	„
4	*I* 66	„	4 „	Thumb-sized focus of bronchopneumonia in median lobe ;	Hæmolytic streptococci
				Mucous exudate in bronchi elsewhere	Sterile
5	*I* 99	„	9 „	Mucous exudate in bronchi	„
6	*I* 6	„	15 „	Bronchopneumonia in apical lobe	Hæmolytic streptococci
7	*I* 37	„	20 „	Same as above, in apical and main lobes	„ „
8	*I* 87	„	56 „	„ „ „ „	„ „
9	*I* 13	Intranasal inoculation with cotton-wool filtrate	7 days	Mucous exudate in bronchi ; peribronchial pneumonic foci	Non-hæmolytic streptococci
10	*I* 52	„	7 „	Mucous exudate in bronchi ; peribronchial pneumonic foci	Sterile
11	*I* 11	„	8 „	Mucous exudate in bronchi	„
12	*I* 4	„	9 „	„ „ „	„
13	*I* 36	„	10 „	Bronchopneumonia in apical and main lobes	Hæmolytic streptococci
14	*I* 60	„	13 „	Same, in apical lobe	„ „
15	*I* 84	„	13 „	„ „ „	„ „
16	*I* 120	„	20 „	Mucous exudate in bronchi. Interstitial tissue distended, yellowish and gelatinous	„ „
17	*I* 23	Intranasal inoculation with bacteria-free filtrate	5 days	Mucous exudate in bronchi ; peribronchial foci	Sterile
18	*I* 34	„	5 „	Mucous exudate in bronchi	„
19	*I* 32	„	6 „	„ „ „	„
20	*I* 39	„	6 „	„ „ „	„
21	*I* 114	„	10 „	„ „ „	„
22	*I* 86	„	11 „	Bronchopneumonia in apical and main lobes	Hæmolytic streptococci
23	*I* 124	„	22 „	Mucous exudate in bronchi	Sterile
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The artificially infected animals were inoculated with the cotton-wool filtrate or bacteria-free filtrate intranasally. All the animals listed in the table were coughing at the time they were slaughtered, that is, for a period which extended to 107 days in one case.

From the records summarised in the table the following remarks may be made. When the course of the disease became prolonged there occurred, in the case of the animals infected naturally by contact or artificially with the cotton-wool filtrate, an increasing number of animals found to be suffering from bronchopneumonia. In each of these two groups, there was discoverable in the case of five out of eight animals a streptococcic invasion, with lesions of extensive pneumonia. The pneumonic lesions were situated in portions of the lungs situated in close proximity to the bronchial trunk. The more recent lesions in the diseased lungs were slightly swollen and hepatised and showed a reddish-brown to greyish-red discoloration. Later, the affected zones became more circumscribed, greyish-brown in colour, and more indurated in consistence. In both recent and long-standing cases, there exuded from the bronchi in the affected areas a stringy yellowish exudate which was purulent in appearance. The interstitial tissue was often distended, infiltrated with gelatinous exudate, and yellowish or greenish in colour. The bronchial lymphatic glands were very distinctly enlarged and watery on section.

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In all cases of bronchopneumonia, streptococci were found in the lesions. In ten cases, the streptococci were found on examination of their biological characters to belong undoubtedly to a single group. One strain, however, showed

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From the records summarised in the table the following remarks may be made. When the course of the disease became prolonged there occurred, in the case of the animals infected naturally by contact or artificially with the cotton-wool filtrate, an increasing number of animals found to be suffering from bronchopneumonia. In each of these two groups, there was discoverable in the case of five out of eight animals a streptococcic invasion, with lesions of extensive pneumonia. The pneumonic lesions were situated in portions of the lungs situated in close proximity to the bronchial trunk. The more recent lesions in the diseased lungs were slightly swollen and hepatised and showed a reddish-brown to greyish-red discoloration. Later, the affected zones became more circumscribed, greyish-brown in colour, and more indurated in consistence. In both recent and long-standing cases, there exuded from the bronchi in the affected areas a stringy yellowish exudate which was purulent in appearance. The interstitial tissue was often distended, infiltrated with gelatinous exudate, and yellowish or greenish in colour. The bronchial lymphatic glands were very distinctly enlarged and watery on section.

3.—*Bacteriological Findings*

In all cases of bronchopneumonia, streptococci were found in the lesions. In ten cases, the streptococci were found on examination of their biological characters to belong undoubtedly to a single group. One strain, however, showed

entirely different cultural characters and could not be identified with any of the known equine pathogenic streptococci. The outstanding property of the ten identical strains was the production of hæmolysis on blood-agar plates. The origin of the blood used was immaterial. At the 12th hour and still more clearly between the 20th and 30th hour after incubation at 37°C., there were seen around the colonies bright zones which became transparent and somewhat deepened with completion of hæmolysis. The colonies were not above the size of pinheads, but the hæmolytic zones were eight to ten times the diameter of the colonies. Good growths were also obtained on Drigalski agar, heated blood [" chocolate "] agar, and ordinary agar, and no change in colour was observed on these media. Microscopic examination of smear preparations made from growths on solid media revealed very small, rounded cocci, usually in the form of diplococci, while in smears made from liquid media there were seen chains each containing not more than eight to ten elements. The organisms were Gram-positive. In peptone water and ordinary beef broth media, and after the addition of lactose and glucose, a finely flocculent growth took place which was deposited in the tube leaving the supernatant liquid clear after 14 days' incubation. Litmus milk and methylene blue milk were changed on incubation at 37°C., the reducing action of the streptococci becoming evident sooner than the acid formation. No growth was obtained at 10°C. Gelatine was not liquefied. White mice died in 24 to 48 hours after subcutaneous inoculation from septicæmia; adult rabbits, on the contrary, were not susceptible.

From the available references in the literature, this streptococcus would appear to be identical with the strains described by Schütz[12] (1887) and isolated by him from the lungs of horses suffering from equine infectious pneumonia. This hæmolytic streptococcus is therefore designated *Diplococcus pneumoniæ* Schütz, 1887.[4, 12*]

Intranasal inoculation of horses with pure cultures of *Diplococcus pneumoniæ* failed to set up any disease [Mollmann[9] and an original experiment of the authors]. The fact that in the above secondary infections hæmolytic streptococci were cultivable from the areas of bronchopneumonia suggests that these micro-organisms gained access to the lungs by way of the bronchi. Among the horses infected by contact or intranasal inoculation of cotton-wool filtrate streptococci were demonstrated in the lungs in the majority of cases (*see* Table No. 1), but among those infected intranasally with the bacteria-free filtrate only one case of secondary infection with streptococci was detected. It follows, therefore, that when infection is spread by contact the virus is not invariably the only infective agent transmitted, but it may be accompanied by streptococci so that the disease then evolves from the outset as a bronchopneumonia. This view receives support from the results of an experiment in which a healthy horse was placed in contact with a severely affected subject, and killed for examination within a short interval, namely, four days, after the beginning of exposure; lesions of bronchopneumonia were already present, which were situated in the middle lobe, whereas elsewhere in the lungs only the changes known to be produced by the virus were discoverable (*see* Table No 1, Serial No. 4).

VI.—Epizootiology of Epizoötic Cough

From the observations and experimental results recorded in the foregoing sections, the conclusion may be drawn that the contagiousness of the disease under study is attributable to a filtrable virus and that, depending on certain circumstances, the disease may assume the form of an infectious bronchopneumonia. Both forms of disease came under recognition as separate entities among horses which had become naturally infected.

Among the racehorses at Hoppegarten—in the care and maintenance of which animals much attention is lavished—the disease usually runs its course as a pure virus infection. As soon as the first symptoms of coughing are noticed the animals are taken off work and only allowed to exercise for half-an-hour to an hour daily. In these circumstances the cough ceases in two to three weeks and after a further interval of a week or two the horses can be put back to full work. On the other hand, the disease runs an entirely different course when the relatively trifling initial symptoms are overlooked and some care is not taken of the animals. The disease came under observation in such circumstances upon five farms in Western Pomerania, where the complications observed were very severe, leading to bronchopneumonia, pleurisy, jaundice and some deaths. Experiments on transmission and propagation of the virus derived from these cases through four serial transfers, proved the identity of the disease with epizoötic cough although at first sight it had seemed on clinical grounds to be a different condition.

An enquiry undertaken subsequently by Dr. Pape, Veterinary Surgeon to the Union Turf

* The common hæmolytic streptococci from horses are now usually divided into two groups, *viz.*, *Str. equi*, which, amongst other characteristics, does not ferment lactose, sorbitol or trehalose, and *Str. pyogenes*, which ferments both lactose and sorbitol. From the data given, it is not possible to say to which of the groups the streptococcus described as *Diplococcus pneumoniæ* belongs.

Club, among the principal organisations concerned with racing and trotting horses, elicited the information that the disease spread among stables throughout Germany within four weeks.[10] The rapidity of spread is to be explained by the movement of the horses from one station to another. The extreme contagiousness of epizoötic cough can be appreciated in the light of the facts recorded. The outbreaks of the disease observed in several parts of Germany during the winter of 1933-34 can be traced to the close relationships prevailing between the blood-stock racing stables with their breeding establishments and farming, heavy horse breeding and Army horses. Similar widespread outbreaks have been reported in early veterinary writings (Zorn[15]).

VII.—Immunity

In Hoppegarten the disease ("Hoppegarten Cough") prevails every year as a more or less widespread condition and Pape[10] has observed that older horses which have been kept in Hoppegarten for several years remain afterwards unaffected or else develop only a slight attack when the disease recurs. Pape believes that after recovery from attack a certain degree of immunity remains against the disease.

The immunity of horses was tested in the course of these experimental studies. The results are summarised in Table No. 2.

Table No. II.

Serial No.	Horse.	1st Infection, Date.	Type of Attack after 1st Infection.	2nd Infection. Interval in Days, after 1st Infection.	Type of Attack after 2nd Infection.
1	*I* 14	17.10.33	Mild	128	Mild, symptoms first seen in 14 days
2	*I* 24	20.10.33	Severe	125	No symptoms
3	*I* 33	26.10.33	Mild	119	Mild, symptoms first seen in 16 days
4	*I* 35	26.10.33	Severe	119	No symptoms
5	*I* 38	1.11.33	„	114	„ „
6	*I* 51	7.11.33	Mild	107	„ „
7	*I* 59	15.11.33	Severe	99	„ „
8	*I* 85	30.11.33	Mild	84	Mild, symptoms first seen in 11 days
9	*I* 121	4.1.34	„	49	Very severe
10	*I* 129	15.1.34	Severe	38	Severe

The number of animals tested is too small to enable one to pronounce finally upon the degree and duration of immunity after an attack. It seems most probable that an immunity is set up, which again is more firmly established when an animal has been through an acute than a mild attack. The acute attacks after second exposure from which the two horses suffered that are listed at the bottom of the table (Table No. 2, Serial Nos. 9 and 10) may be explained by taking the view that it takes longer than a certain interval, 38 days in one case and 49 days in the other, for an immunity to develop. Another explanation would be, however, that the period of convalescence after the first attack had not yet come to an end, and that the second infection had brought about a superadded attack and not a second attack.

A further interesting observation made upon horses subjected to a repeated infection was that some of these animals showed no sign of disease. The animals used first in the experiments were purchased chiefly from East Prussia. In February, 1934, when the disease was raging at the time throughout Germany, there was an increase in the number of horses drafted from this source which either failed to react or else reacted very late after infection. Inasmuch as the disease was known to prevail during this period in Western Pomerania it was inferred that horses purchased there had acquired immunity as the result of a previous attack. There exists, however, the possibility of an individual resistance against the virus.

VIII.—Transmission of the Virus to Other Animals

1.—Pigs

Pigs inoculated intranasally with bacteria-free filtrate (dose, 10 c.c.) derived from affected lungs became ill and the virus was propagated in these animals through eight serial transfers. On the first or second day after infection the pigs displayed conjunctivitis, dullness, and loss of appetite. If a pig was killed on the fourth to sixth days after inoculation, multiple and sometimes very numerous greyish-brown or reddish-brown slightly enlarged lobules could be seen irregularly distributed in the apical, middle, and main lobes of the lungs. There was no exudate seen on the bronchial mucosa. Histologically, the lesions were identical in structure with those caused by the virus infection in the horse and the naked-eye appearance of the lesions differed from that produced by the virus of swine influenza (Köbe[5]). It was found that infection could be transmitted to horses with the virus of epizoötic cough obtained after eight serial transfers through

pigs. On the other hand, a horse inoculated with the virus of swine influenza did not become affected.

2.—Cattle

Cattle also contracted the disease, showing symptoms and lesions similar to those observed in horses. The epizoötic cough spread by contact from three affected horses to 16 head of two-year-old cattle. The animals began to show symptoms of coughing on the second or third day after exposure. When several animals were kept in close contact the disease was found on *post-mortem* examination to possess the characters of an infectious bronchopneumonia. In the lung lesions of cattle bacteria were found comprising streptococci, micrococci, and bipolar organisms [pasteurella]. Infection was transmitted to three calves and one horse by inoculation with bacteria-free filtrate derived from the lung lesions of cattle that had been infected by contact. The virus from the disease in horses was also readily transmitted by intranasal inoculation to three calves and two bullocks. It was therefore concluded that epizoötic cough in horses is transmissible to cattle.

A disease known as "Infectious Bronchitis of Cattle" has been described by several authors, but the ætiology of the disease had not been cleared up. It is possible that the virus of epizoötic cough in horses is identical with that of infectious bronchitis of cattle. Experiments have not yet been carried out, however, in which, as proof of this assumption, horses have been shown to become attacked after they have been exposed to infection in the scene of natural outbreaks of the cattle disease.

IX.—The Relationships between Epizoötic Cough and the other Infectious Diseases of the Respiratory Tract in Horses

The ætiology of most of the infectious diseases of the respiratory tract in horses has not yet been elucidated. To this group there belong equine pneumonia, infectious bronchopneumonia or Brussels disease ["shipping fever"], epizoötic laryngo-tracheal catarrh, infectious catarrh of the air-passages and skalma. From the researches of Gaffky and Lührs[8] equine pneumonia appears to be an independent disease. The causal agent seems to be a virus. The other diseases referred to differ more in the names which have been applied to them than in their clinical characters. If one compares the descriptions given of epizoötic laryngo-tracheal catarrh, infectious catarrh of the air-passages, skalma, and infectious bronchopneumonia with the symptoms and lesions that have been recorded here—on the one hand in the disease caused by the virus and on the other hand with the complications described in some cases (Section V)—one finds that the above-named infectious conditions correspond with the manifestations of epizoötic cough or of its complications. Variations appearing in the courses of different epizoötics and in particular cases of the disease are caused by extraneous circumstances, and these variations came under the notice of the present writers in the different conditions in which the last widespread epizoötic of the disease was observed and in the experiments that were undertaken. In Sections V and VI, it was shown how under the influence of certain predisposing causes, such as work, fatigue, and a certain configuration of the horse secondary bacterial infection was favoured, so that the characteristics of the disease as a virus infection were completely masked. It is therefore believed that following the elucidation of the ætiology of epizoötic cough, the following equine diseases will be found to be identical with it:—

Epizoötic Cough (Infectious Bronchitis)

Pure virus disease	Secondary bacterial infection
= Hoppegarten cough	= Infectious broncho-pneumonia (Wirth)
= Epizoötic laryngo-tracheal catarrh	= Brussels Disease (Reinhardt)
= Infectious catarrh of the air-passages	
= Skalma (Dieckerhoff)	
= Influenza (Leclainche)	

X.—Summary

(1) Epizoötic cough in horses is caused by a filtrable virus. All other breeds of horses as well as blood-stock are equally susceptible to infection.

(2) The virus infection sets up lesions of bronchitis and peribronchitis.

(3) The chief symptom of the disease is a dry, deep cough.

(4) The disease is readily transmissible from horse to horse.

(5) The incubation period is usually from two to three days.

(6) After infection with the virus, the animal becomes immune. The degree of immunity seems to depend upon the severity of the attack.

(7) When an affected animal is retained in unfavourable environmental conditions, the attack brought about by the virus alone may be complicated by a secondary infection, which is produced for the most part by *Diplococcus pneumoniæ* Schütz, 1887.

(8) Secondary infection with bacterial invaders confers upon an outbreak the clinical characteristics of an infectious bronchopneumonia.

(9) Epizoötic cough in horses is identical with Hoppegarten cough, epizoötic laryngo-tracheal catarrh, infectious catarrh of the air-passages, and skalma, and if complications set in caused by secondary bacterial invaders, with Brussels disease [" shipping fever "] or infectious bronchopneumonia.

(10) The virus of epizoötic cough is transmissible to pigs and cattle.

(11) Infectious bronchitis of cattle is apparently also caused by the virus of epizoötic cough in horses.

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J. T. E.

EXPERIMENTAL GOAT'S MILK ANÆMIA

In a recent issue *The British Medical Journal* makes reference to the work of H. L. Alt, who, in the *Proceedings of the Society of Experimental Biology and Medicine*, October, 1935, draws attention to reports in the German literature on the development of a syndrome resembling that of pernicious anæmia which occurs in infants fed on goat's milk. Some of these cases apparently respond to liver therapy but not to iron therapy. Experimental attempts by the author to produce a hyperchromic anæmia in rats by feeding them on goat's milk were not successful. Instead, a hypochromic anæmia was produced, the hæmoglobin failing without any corresponding drop in the number of red cells. The condition was similar to that observed in rats fed on cow's milk, and was readily cured by an iron and copper supplement. A hyperchromic anæmia has been reported by various observers in rats fed on goat's milk. Alt remarks that the discrepancy between the results of different experimental workers in the type of anæmia produced deserves examination.

* * * * *

A mare belonging to a dairy company was drawing a van in Bloemfontein Road, Shepherd's Bush, when she gave birth to a foal. Half-a-dozen policemen helped to get the mare and foal into a horse ambulance. Mare and foal are reported to be " doing well."

Clinical Communication

EQUINE DEBILITY DUE TO TRICHOSTRONGYLUS AXEI*

G. E. OXSPRING, O.B.E., F.R.C.V.S., R.A.V.C.

The following observations are made in presenting for the inspection of the Fellows of the Central Veterinary Society some of the pyloric portion of a horse's stomach, preserved for museum purposes, so that the natural colour has been retained. It will be seen that the gastric mucosa is greatly inflamed, hæmorrhagic, thickened into elevated folds and at the autopsy it was covered with sticky mucus. It gave the impression of having been subjected to long-standing irritation.

The specimen was taken from one of those cases of debility which all members with experience of horse practice know so well. Sometimes the cause is easily ascertained, but in other cases it cannot be detected during life. The horse in question belonged to the latter class—for no obvious cause of the condition could be found. The blood count showed a high eosinophile percentage, and parasitism was suspected, in spite of the fact that the ova count in the fæces was extremely low. Two young horses purchased by the Remount Department exhibited identical symptoms, and a long and patient effort at treatment being futile, they were destroyed.

Scrapings taken from any part of the gastric mucosa and examined microscopically revealed the presence of *Trichostrongylus axei*, and no parasites could be found in the mucus lying on the surface of the gastric mucosa even after dilution and centrifuging.

During the past two years, three other cases of this nature have come under my observation.

The literature rather leads one to think that *Trichostrongylus axei* does little harm and is often present in normal stomachs. Every opportunity since the occurrence of these cases has been taken to examine the stomachs of horses destroyed for reasons other than debility or intestinal conditions, and in no case could this parasite be found in the stomach.

In the cases mentioned, it is quite impossible to dissociate *Trichostrongylus axei* from blame, and the question arises as to whether this parasite is a responsible factor in more of the intractable debility cases than has been imagined in the past.

* Communication made (with exhibit) to a meeting of the Central Division, N.V.M.A., at the Conway Hall, Red Lion Square, W.C.1, on December 5th, 1935.

Discussion

In reply to the President (Captain J. F. Macdonald), Major Oxspring said the stomach tube treatment for parasitic infestation was adopted, but was without effect.

The Hon. Secretary (Mr. H. E. Bywater) said that he thought that while it was common knowledge that oil of chenopodium was not very efficacious as an agent against infestation by Trichostrongyles, it occurred to him that nicotine sulphate (40 per cent.) might prove to be as useful in equines as it was recognised to be in ruminants.

Major Oxspring thanked the Hon. Secretary for his suggestion, but he pointed out that the parasite did not appear to cause the drastic damage in ruminants that it did in the horse, in which animal he had examined sections of the stomach wall and found considerable fibrosis, and doubtless much loss of function resulted. He would certainly try the use of nicotine sulphate, but thought the condition of the mucosa caused by *Trichostrongylus axei* was too far advanced when it became diagnosable for the agent suggested to be of much practical value.

CULTIVATION OF THE UNFIT

The question of whether our philanthropic efforts to save the lives of all babies, however weakly, may not serve as actual hindrances to the future well-being and progress of our race was raised by Lord Dawson of Penn in his recent address to the York Medical Society, and in reference to this *Nature* (January 11th) observes: "Amongst the lower species of animals, we may, without serious error, assume that the birth-rate remains approximately constant; and the recurrent plagues of over-population are brought back to normal dimensions by the increase (1) in predatory animals, (2) in the incidence of disease. Only the most vigorous members of the species survive, and these are the worthy progenitors of the next generation. If this weeding out of the unfit is prevented, there follows a deterioration of the whole species. Two examples of this on a gigantic scale are sufficiently interesting to be recorded here. The first occurred in Switzerland: the second in New Zealand. The Swiss established a park for the preservation of the chamois, from which wolves were carefully excluded. As a result, more and more weakly and deformed specimens appeared amongst the stock until at last the Swiss introduced a certain proportion of wolves; these found in the weaker chamois an easy prey, and the surviving stock recovered its vigour and fine appearance. New Zealand has always been an ideal field for rearing mammals, because in it there are no indigenous predatory animals whatever. The Scottish settlers longed for the red deer of their native highlands, so these were introduced and let loose upon the New Zealand hills, where they flourished exceedingly. But soon the herds became polluted by misshapen specimens, and in the end wolves had to be imported to weed out the unfit."

After discounting both sterilisation and birth-control as adequate means of maintaining a healthy race, *Nature* concludes by saying: "In 1730, out of every five children born in London three died before attaining the age of five: now we carefully preserve all alive and in so doing we have prepared for ourselves a terrible problem which we or our successors will have to face."

Abstracts

[**The Correlation of Anatomy and Epidural Anæsthesia in Domestic Animals.** Hopkins, G. S. (1935.) *Cornell Vet.* **25.** 3. 263-270.]

This article is mostly concerned with the anatomy of the sites used for epidural injections, with the mode of termination of the spinal cord in the various species, and with the course and distribution of the lumbar, sacral, and coccygeal nerves. This ground was covered in detail by G. B. Brook [*Vet. Rec.*, 1935.].

Of great interest is the consideration of the possibility of traumatic injury to nerves by intercoccygeal injection.

At the first intercoccygeal space, the spinal canal of the horse and ox contains five pairs of nerves, spread out on the floor. At the most, two of these nerves might be injured by the needle, but it seems more likely that the nerves would be deflected laterally. Injury to one or two nerves would be of no consequence, since the affected muscles would still receive innervation from the numerous branches of the dorso- and ventro-lateral nerves, which arise at the sacro-coccygeal space. [The latter are anæsthetised by the passing of the anæsthetic solution up the epidural space.]

The article is accompanied by four superb illustrations.

E. W. A.

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[**A Contribution on the Treatment of Summer Sores in Horses.** (Trans. title.) Schmidt. (1935.) *Zeit. Veterinärk.* **47.** 6. pp. 189-201. (50 refs.)]

The author's personal investigations concern trials of two treatments, (*a*) freezing with ethyl chloride, and (*b*) baths in carbon dioxide. Thirty cases, in all, were treated. Neither method was attended with any marked success, although freezing with ethyl chloride appeared to have a distinct action in checking the enlargement of the sores.

The procedure adopted was to spray with ethyl chloride until the lesion became covered with ice, and small knobs of ice appeared on the surrounding hairs. The scab which subsequently formed was removed and unhealthy granulations cut away with a sharp knife. Further treatment with tincture of iodine or an ointment containing "rivanol" (an acridine dye) was found to be essential, and in some instances healing took place in two-and-a-half weeks; others took four, six or nine weeks, according to the size of the wound.

The carbon dioxide treatment—which has been found beneficial for inducing healing in gangrenous wounds—was applied by means of a special rubber "stocking" enclosing the lower part of the limb up to the knee or hock. The

sores were washed, unhealthy granulations removed, the leg moistened, the stocking applied and carbon dioxide pumped in and left in contact with the leg for 30 to 40 minutes. Eighteen horses were treated by this method, but the beneficial result was again slight, and it was found necessary to use other applications before the lesion would finally heal.

The clear demonstration of the cause of summer sores is, in the author's opinion, a most important step towards the ultimate solution of this problem, as, although spirurid larvæ of the genus *Habronema* have some definite connection there are several points in the ætiology which are still obscure.

E. L. T.

* * * * *

[Effects of Uncomplicated Phosphorus Deficiency on the Œstrus Cycle, Reproduction and Composition of Tissues of Mature Dairy Cows. Eckles, E. H., Palmer, L. E., Gullickson, T. W., Fitch, C. P., Boyd, W. L., Bishop, L., and Nelson, J. W. (1935.) *Cornell Vet.* **25.** 1. 22-43.]

The effect of dietary deficiencies on the fertility of animals is a subject of much controversy at the present time and often, although circumstantial evidence and practical experience would point towards abnormalities of the reproduction cycle being due to such deficiencies, the picture is too obscured by pathological conditions to ensure a correct interpretation being made. The present paper deals with the effects on the œstrus cycle of a diet in which the phosphorus content was the only limiting factor as far as could be ascertained. Eight cows were placed on experiment and fed on rations containing enough phosphorus to keep the blood inorganic phosphorus at 2·5 mg. per cent., which is about one-half the normal level. Chemical analysis of bones and tissues proved beyond doubt that the animals actually had been subjected to a severe phosphorus deficiency. The occurrence of œstrum and menstruation was recorded and, in addition, a careful physical examination of the reproductive organs was conducted at intervals of one month and sometimes fortnightly. The vagina was examined for the purpose of determining the degree of dryness or moisture of the mucous membrane, the uterus for the purpose of muscle tone and the ovaries for the determination of the presence or absence of mature follicles. The bull used was normal in all respects and was fed a complete ration. No evidence was obtained to show that the phosphorus deficiency employed in the experiment influenced the œstrus cycles of cows over a period of two or three years. The breeding efficiency of the whole low phosphorus group was very low, but it was impossible to ascertain if this was entirely due to the diet. The authors concluded that the disturbances in œstrus cycle and breeding efficiency in phosphorus-deficient areas under natural conditions reported by many workers may have been due to complicated nutritive deficiencies usually prevalent under such conditions and not to phosphorus deficiency alone.

J. S.

* * * * *

[Supplementary Report of an Experiment to determine the Effects of a Low Calcium Ration on Reproduction in Cattle. Effects of Further Reduction in Calcium and of Removing Vitamin Supplements. Palmer, L. S., Fitch, C. P., Gullickson, T. W., and Boyd, W. L. (1935.) *Cornell Vet.* **25.** 3. 229-246.]

This work is complementary to that on the effects of phosphorus deficiency on fertility carried out by the authors and which is abstracted above. It was previously reported by these workers that cows receiving only 0·18 per cent. of calcium in the dry matter of their rations, which were otherwise nutritionally adequate, did not show any decrease in breeding efficiency and no marked effect, attributable to the level of calcium in the diet, was observed in the chemical composition of their blood and milk. This paper contains the results of further work, but with a lower plane of calcium in the ration. Three cows that had reproduced normally on a ration containing 0·18 per cent. of calcium exhibited no abortions when on a ration which contained only 0·12 per cent. of calcium but which was otherwise complete from a nutritional standpoint. Five other cows which had had normal pregnancies during three years on rations containing 0·18, 0·35 and 0·65 per cent. calcium and supplemented by an adequate supply of vitamins did not show any significant changes in breeding efficiency when the vitamin supplements were removed from the ration. Neither the lowering of the plane of the calcium content of the ration nor the removal of the vitamin supplements appeared to affect either milk production or composition. Slight effects on blood and bone composition are discussed.

J. S.

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[Clinical and Experimental Observations on Chylous and Chyliform Effusions in Domestic Carnivores. Brion, A. (1935.) *Rec. Méd. vét.* **3.** 6. 321-334.]

The literature on the subject is reviewed at great length, and very complete accounts are given of several cases in dogs and cats, including the microscopic, bacteriological, and biochemical properties of the fluids.

Attempts at producing chylous ascites in six cats, by section of mesenteric lymphatic vessels, failed completely. Incisions into a certain abdominal lymphatic gland (*cisterne de Pecquet*) in five dogs were likewise unsuccessful except for a temporary escape of lymph at the time of operating.

Review

[Banham, G. A., and Young, W. J.: **"Veterinary Posology."** Sixth Edition, pp. 374 + xii. Baillière, Tindall & Cox, 8, Henrietta Street, Covent Garden, W.C.2. Price 8s. 6d. nett.]

Banham and Young's "Veterinary Posology" is too well known to veterinary surgeons to need introduction. It has been described as the most useful book in the veterinarian's library—for the title very inadequately indicates its scope—and one or other of the editions is to be found in the possession of the great majority of veterinary practitioners and the senior students at the veterinary colleges.

The new edition is even more valuable than its predecessors, having been enlarged by an additional 15 pages—a new feature being a table of bacteriological nomenclature, giving both the newer terminology prepared by the Society of American Bacteriologists and the older, and to most the more familiar, names, together with a list of the diseases with which they are associated. A table of 48 pages is devoted to various trade names and synonyms for drugs, which will prove of very real value to both the student and practitioner; whilst a table of the composition and nutritive value of the various feeding stuffs will prove a handy reference to those who delight, or perhaps are forced, to juggle with protein ratios and "balanced" rations.

In a book such as this, small in size but packed with tables containing information on a vast variety of subjects, to which the practitioner finds himself constantly turning in order to refresh his memory, it is humanly impossible to avoid leaving opportunities which a reviewer can use for the purposes of criticism. It is solely with the object of rendering future editions of the book even more useful that the following constructive criticisms are tendered.

The Posological tables would be improved by the inclusion of the strength, or approximate strength, of all the preparations of a drug given; for instance, under Acid Carbolic Liq., whilst the glycerine and ointment are without indication as to the percentage of phenol, the strengths of the other preparations are given.

The therapeutical classification of drugs contains a list of alteratives, which if fully stated should give practically all drugs, official and non-official. The word "alterative" is a legacy from the days of the "blunderbuss" method of prescribing and its use is to be discouraged to the full. The classification of anthelmintics could be made much more useful and reliable by tabulating the agents which are specifics or of special use against the various helminths: Ol. chenopodium is classified as a Tænifuge and also finds a place under "others"; Ol. chenopodium is a recognised agent against Hookworms, Ascarides and some other nematodes, but is certainly not of especial use against Tænia. Arecoline hydrobromide is not mentioned (areca nut is) but it is a specific against Tænia in the dog. Such drugs as pumpkin seeds, ferri sulph. asafœtida, gentian, etc., could then be relegated under "others" if it were considered desirable to continue to include them.

Glancing through the Table of Diseases and Suggested Therapeutics it is noted with surprise that hexamine does not find a place amongst the agents to be used in either cystitis or nephritis, whilst the same criticism offered above with regard to vermifuges is even more necessary in this table.

The agents universally acknowledged to be of use in the treatment of a disease should take precedence of other agents; this is especially noted under parturient apoplexy, where calcium therapy is the last measure mentioned, whilst bromides and chloral hydrate rank first on the list.

A serious omission is the lack of reference to the provisions of the Dangerous Drugs Acts.

Finally, a book such as this, which is essentially one to which frequent reference is to be expected, deserves a binding which is rather more resistant to rough handling than the present one.

The iodine number of the fat in the chylous fluid from the peritoneal cavity of a cat was markedly lowered by the oral administration of fat of low iodine number, and was raised by similar administration of fat of high iodine number. (Strauss Test.)

The above is of interest in view of the theory that chylous effusions are due to leakage from lymphatic vessels. Chylous and chyliform (false chylous) effusions differ as follows:—

Chylous.	Chyliform.
White or faintly pink fluids, with high fat content (0·42 and 0·44 per cent. in Brion's cases).	White or pink fluids with low fat content (0·11, 0·06 and 0·05 per cent. in author's three cases).
Products of protein disintegration absent.	Peptones, polypeptide and amino acids present.
Sterile.	Bacteria present.
Strauss test positive.	Negative.
Probably caused by leakage from a lymphatic vessel.	Probably produced by fatty degeneration of cells in an exudate (as in pleurisy).

It is interesting to note that, according to various observers, the presence of the following substances in effusions can cause a milkiness: Substance similar to casein, phosphatids, cholesterol, and a glucoprotein similar to mucin.

E. W. A.

Report

ARMY VETERINARY SERVICES IN INDIA

ANNUAL ADMINISTRATION REPORT FOR 1934-35.

The report includes all Army animals in India and Burma, the average strength of which was as follows :—

Total horses	32,329
Total mules	27,033
Total camels	3,854
Total cattle	9,458
Total donkeys	134
Total average strength ..	72,808

Working of the Army Veterinary Service in India

(*a*) The Secretary of State for India having approved of the Indianization scheme of the I.A.V.C., nine Indian M.sR.C.V.S. have received direct commissions in His Majesty's Indian Land Forces and are undergoing six months' probation.

(*b*) Army Veterinary Schools.—Courses in Animal Management for B.O.R.s, I.O.s and I.O.R.s were resumed this year after having been suspended for three years. The results of these courses were as follows :—

Army Veterinary Schools, Ambala and Poona.

I.O.s.—Number attended 50—all passed.

B.O.R.s.—Number attended 60—51 passed, 8 failed.

I.O.R.s.—Number attended 61—all passed.

A post-graduate course for Veterinary Assistant Surgeons was held at Ambala and six attended. It is proposed to open the courses for British officers the next official year.

General Remarks

(*a*) The general condition of the animals in the Army is good.

(*b*) Among the general diseases which occurred this year the following are recorded :—

Colic in Quetta.—Since the practice was introduced in Quetta of giving in lieu of bhoosa 7 lbs. of hay to horses during the winter and 7 lbs. of green fodder to horses and 4 lbs. to mules during the summer, there has been a decrease in the incidence of colic.

Nutritional diseases.—Since cows in calf at the Military Dairy Farm, Quetta, have received a regular green fodder ration, no further cases of blindness have occurred among newly born calves.

Paraplegia.—Eighteen cases occurred in the Southern Command, 14 of which were in the Deccan District and 12 in the Western Command, with three deaths as compared with 70 cases and 21 deaths last year.

Ringworm.—There were 21 admissions in units and 85 in remount depôts.

Bursatti.—In units there were 162 admissions among horses and 111 among mules. In remount depôts there were two admissions among horses and seven admissions among mules.

Catarrh.—In units there were 334 admissions among horses and 110 among mules. In remount depots there were 512 cases among horses, of which 462 occurred in the Indian young stock depôts ; 94 mules, one bullock and nine donkeys were admitted under this disease in depôts.

Variola.—Admissions, 22 cattle and two camels ; mortality, two camels.

Castration.—Nine hundred and eleven horses and 266 mules were operated on—no deaths occurred.

Remarks on Specific Diseases

(*a*) *Anthrax.*—Fifteen cases occurred ; all were fatal.

Owing to the widespread distribution of anthrax in Burma, 50 per cent. of the mules were inoculated with spore vaccine, with only two deaths.

(*b*) *Blackquarter.*—There were no cases during the year.

(*c*) *Contagious Abortion.*—Three admissions in the donkey stud farm and ten admissions among cows in the military dairy farms occurred in the Northern Command, and two in the Eastern Command.

(*d*) *Foot-and-Mouth Disease.*—There were 25 outbreaks, involving 1,247 admissions and 15 deaths, against 1,343 admissions and 16 deaths last year.

(*e*) *Glanders.*—Seven cases were reported as against eight last year. These included three ponies at Gyantse where the disease is endemic.

(*f*) *Hæmorrhagic Septicæmia.*—Eighteen cases with ten deaths occurred in the Northern Command.

(*g*) *Equine Influenza.*—This year the incidence of equine influenza was higher than last year. Between November 13th, 1934, and March 31st, 1935, 22 cantonments and 3,648 animals were affected in the Northern and Eastern Commands. The first outbreak occurred at Rawalpindi where it was reported that the disease was prevalent among civilian-owned horses and within 17 days nine units and 384 animals were affected. The second outbreak occurred at Lahore where three units and 213 animals were affected. The third outbreak occurred at Ferozepore, 90 animals being affected. The fourth and fifth outbreaks occurred at Razmak and Wana, the disease assuming a malignant

form. There were 63 admissions and five deaths. The sixth outbreak took place among the American mules and Australian horses working in Mona depôt. Through the vigilance of Major Hughes, R.A.V.C., the admissions were limited to 48 Australian horses and 85 imported mules. Between February 4th and March 11th, there were three smaller outbreaks at Kohat, Bannu and Sialkot. As a result of the Eastern Command manœuvres and return of troops to their stations, Meerut, Jhansi, Roorkee, Cawnpore, Fyzabad and Dehra Dun, 34 units and 1,393 animals contracted the disease, infection being attributable to tonga ponies working in Delhi. In addition to this outbreak there were five others, *viz.*, at Bareilly, Muttra, Allahabad, Saharanpur Remount Depôt and Calcutta, there being 875 admissions among Australian remounts at Saharanpur Remount Depôt within ten days.

Observations made during the outbreak show :

(1) Generalised dissemination is a dangerous policy in the Army, because of the number of units liable to be thrown out of action at one time.

(2) If in-contacts do not develop the disease within 14 days, they may be considered to be immune.

(3) Cessation of work of all in-contacts may disorganize work at the time but it prevents the development of serious symptoms and complications and reduces the death roll.

(4) An important piece of work was carried out by Mr. Haddow, the Imperial Bacteriologist, Muktesar, in collaboration with Lt.-Colonel V. C. Leckie, D.S.O., and Major G. F. Steevenson during the Lucknow outbreak.

(5) Mules are susceptible and may be carriers.

(6) Cured animals are carriers for three weeks.

(7) Cavalry horses in this outbreak were more susceptible than artillery horses. The percentage of admissions to animal strength was 36 in cavalry and eight in artillery.

(8) A military restriction order is ineffective without co-operation of the civil government.

(9) Stricter veterinary police regulations are required and as the Rawalpindi Area for equine epizootics is under Army control, a more adequate veterinary staff is needed for this area to deal with the situation.

(10) It is essential that equine influenza should be included in the schedule of notifiable diseases in India.

(*h*) *Jhooling.*—There were 22 admissions in the Northern Command.

(*i*) *Piroplasmosis.*—There was a marked increase in the number of cases of this disease. In all, 175 animals (150 horses, 1 mule, 24 cattle) were affected, of which nine (six horses and three cattle) died. Excellent results continue to attend treatment by intravenous or intramuscular injections of quinine acid hydrobromide and the "graduated tube" method of diagnosis proved most reliable.

(*j*) *Rabies.*—Seven fatal cases occurred during the year.

(*k*) *Rinderpest.*—Forty-nine cases and 28 deaths occurred in Military Dairy Farms. During the year 2,751 cattle of the Military Dairy Farms, Military Grass Farms and Remount Depôts were immunized, no casualties resulting. An important experiment which is likely to influence future policy in regard to anti-rinderpest inoculation, was carried out by Major G. Barnett, M.C., R.A.V.C., 148 animals, crossbred and indigenous, young stock and adult, were inoculated with goat virus alone, serum being kept at hand to control severe reactions. Fifty-three animals reacted, including all the cross-bred stock (36), six of which were given serum. There were no casualties. This method of immunization is much cheaper than the serum simultaneous and there is good reason for believing that it is more effective. It will, therefore, be adopted on a larger scale next year.

(*l*) *Strangles.*—The incidence of strangles is principally associated with the indigenous young stock depôts at Mona and Sargodha. In the Ahmednagar Stud Depôt there were 40 (horses) admissions and five deaths. In Mona and Sargodha the admissions were 1,228 horses, 440 mules and 20 donkeys. The percentage of mortality to admissions was 6·1 in horses, 0·9 in mules, 15 in donkeys, or 4·85 total admissions, 85 per cent. of deaths in Sargodha were due to septic pneumonia. The disease was more virulent in the depôts than last year and the same observation is made regarding the incidence of the disease in horse-breeding areas. During the year further experiments, with encouraging results, were carried out by the Imperial Institute of Veterinary Research and Major F. J. Andrews, B.Sc., the Field Investigation Officer, on transmission of the disease with a prepared culture.

(*m*) *Tetanus.*—Admissions in units—8 horses, 4 mules and 1 camel. Admissions in remount depôts—14 horses and 3 mules. Deaths—14 horses and 4 mules.

(*n*) *Tuberculosis.*—There were 14 admissions among cattle, eight of which died. One camel was admitted and died.

(*o*) *Trypanosomiasis—Surra.*—One horse and 353 camels were affected and five camels died. The mercuric chloride test was applied to all silladar camels on being called up and to individual cases as necessity arose. The test has now been adopted as a routine measure and an outfit to enable it to be carried out in the field has been designed. The naganol treatment was given in all cases.

Horse Breeding Areas in the Punjab.

Animal strength—455 stallions and 13,665 mares and young stock. The percentages of admissions to animal strength in the Montgomery Area were 95·8 stallions, 119·3 mares and young stock; in the Shapur Area 78·6 stallions, 117·1 mares and young stock; and in the Chenab Area 69·5 stallions, 44·1 mares and young stock. The mortality rates per animal strength in the Montgomery Area were 1·6 per cent. stallions, 4·59 per cent. mares and young stock; Shapur Area, 8 per cent. stallions and 2·55 per cent. mares and young stock; Chenab Area, 2·1 per cent. stallions and 2·08 per cent. mares and young stock.

Equine Contagious Abortion.—The vaccination experiments carried out by the Imperial Institute of Veterinary Research, Muktesar, are giving satisfactory results.

Pyo-septicæmia equorum (*joint ill*).—The incidence varies in different areas. In the Montgomery Area there were 19 admissions and 12 deaths; in Shapur Area, 275 admissions and 52 deaths; and in the Chenab Area, five admissions and five deaths.

Glanders.—There was one outbreak in the Shapur Area and two occurred in the Rawalpindi Area. The first outbreak took place in Bhera City where two clinical cases were discovered. All horses in the city were tested with mallein; seven reacted. The second outbreak was in the Hazara District; 169 equidæ were tested, three reacted and were destroyed. The third outbreak was in Rawalpindi City; 877 horses were tested, six reacted and were destroyed.

Surra.—There were 123 admissions and 14 deaths. Naganol was administered intravenously in ordinary, and intrathecally in advanced, cases with 89 per cent. of success.

Strangles.—There were 667 admissions and 36 deaths.

Colic.—Admissions 1,303 and 117 deaths (8·9 per cent.).

Nutritional Diseases.—Major Sinton reports that a condition of enlarged fetlock (ostitis at the lower end of cannon bones) is a common cause of rejection for purchase in young stock. He also remarks that mares are kept too fat, and the normal ration is an unbalanced ration which is deficient in proteins. There is a vast field for research work in nutrition and nutritional diseases of young equine stock in India.

Veterinary Organization in the Areas.

Although the work of the Veterinary Assistant Surgeons in the areas is under the supervision of veterinary officers, yet this subordinate personnel is not under any veterinary administration. As all equine contagious diseases in the areas are under military control, it would be an advantage from a veterinary standpoint, that all veterinary personnel should be under proper technical administration.

The Incidence of Bone Diseases liable to cause Chronic Disability among Australian and Indian Horses and a comparison between the Two Breeds.

For the past three years statistics have been collected of the incidence of this form of lameness from nine British and Indian cavalry regiments. Each regiment being mounted on both Australian and Indian horses, the question of stable management, dietetics and work may be accepted as identical. The diseases in the statistics include side-bones, sesamoiditis, ring-bone, arthritis, ostitis (excluding splints) and spavin. The total average strength was 2,596 Australian and 1,957 Indian horses. Admissions in respect to Australian horses numbered 644, or 21·78 per cent., for the whole period or 7·26 per annum. The number of cases in Indian horses was 471, or 24·06 per cent. for the whole period or 8·02 per annum.

The percentage of admissions in each disease compared with total admissions was as follows:

Side-bones—9·00 Australian; 10·19 Indian.
Sesamoiditis—6·22 Australian; 11·49 Indian.
Ring-bone—27·95 Australian; 19·96 Indian.
Arthritis—16·77 Australian; 18·05 Indian.
Ostitis—23·76 Australian; 21·23 Indian.
Spavin—16·30 Australian; 19·10 Indian.

Side-bones.—Admissions—58 Australians, 48 Indians. The incidence of side-bones in the Indian horse is higher than in the Australian, the ratio being 24 to 19 per 1,000, and the percentage of admissions occurs much earlier.

Sesamoiditis.—Admissions—40 Australians, 54 Indians. The incidence of sesamoiditis in the Indian horse is 27·6 per 1,000, to 13·5 per 1,000 in the Australian. The majority of cases occur between 8 to 13 years. There are few cases after 13 years in the Indian horse.

Ring-bone.—Admissions—108 Australians, 85 Indians. The rate of admissions of ring-bone to animal strength in Australians is 60 per 1,000 and in the Indians 48 per 1,000. There is every indication that ring-bone is more prevalent in the Australian than the Indian horse and the rates of admission is two Australian horses to one Indian.

Arthritis.—Admissions—108 Australians, 85 Indians. The percentage of admissions to animal strength is 43·4 per 1,000 in the Indian to 36·5 per 1,000 in the Australian breed. In both cases over 60 per cent. of cases occur under six years' service.

Ostitis.—Admissions—153 Australians, 100 Indians. Although the rate of admissions is three Australians to two Indians, the incidence of the disease compared with animal strength is practically the same in both breeds. In this disease, as in others, the Australian horse has a

comparatively higher percentage of cases in later life than has the Indian horse.

Spavin.—Admissions—105 Australians, 90 Indians. The incidence of this disease is 35·5 per 1,000 in Australian horses to 45·9 in Indian, but the most striking feature is the high percentage of admissions in the Indian horse under ten years of age and under six years of work.

The deductions to be drawn from these statistics are :—

(1) The incidence of bone disease lameness is higher in the Indian than in the Australian horse.

(2) Ring-bone is more prevalent in the Australian than in the Indian breed.

(3) Sesamoiditis, side-bones and spavin are more prevalent in the Indian than in the Australian.

(4) The incidence of bone disease lameness is higher at an earlier age in the Indian than in the Australian horse. This may be due to the practice of working the indigenous horse younger than the imported one, or to a food deficiency during growth.

(5) The incidence of bone disease lameness is spread over a longer period in the Australian than in the Indian breed. Also, the percentage of admissions is higher at an older age and after more years of work. As an economic proposition these facts are to the advantage of the Australian horse.

(6) With this knowledge at hand, it is possible to reduce the incidence of bone disease lameness in the Indian horse by careful selection at the stud, hygienic treatment in young stock, scientific investigation of dietetics for young equine stock and by bringing the Indian horse into work at the same age as the Australian.

Statement showing Results of Veterinary Examination of Australian Horses purchased as Army Remounts.

Two thousand and seventy-three horses were examined, of which 7·3 per cent. were rejected for the following veterinary reasons : side-bones 12, ring-bone 17, spavin 11, cataract 38, opacity cornea 6, roaring and whistling 55, various 13. Total 152.

Acknowledgment.—The assistance rendered by Mr. F. Ware, the Director of the Imperial Institute of Veterinary Research, Muktesar, and his staff in diagnosis and other problems connected with contagious disease is gratefully acknowledged. J. M.

The county branches of the National Farmers' Union have been asked to supply headquarters with information as to the existence of poultry disease in their localities. This is for the benefit of the Ministry of Agriculture's technical committee of enquiry.

QUARTERLY MEETING OF COUNCIL, N.V.M.A.

Summary of Proceedings

It will be made very obvious to our readers by the report of the January meeting of Council, N.V.M.A., to be published in our next issue, that the business of the governing body of the Association increases quarterly, not only in volume, but in moment. It is now true to say that no Division can be satisfied with nominal representation on the Council, and a widespread appreciation of this position was evidenced by the very representative character of the attendance.

It is but rarely that the innocent-looking item "matters arising from the minutes" holds up succeeding business for an hour or more, but this was the time occupied in consideration of the interim correspondence from over the Border relative to the Scottish proposals for the payment of travelling expenses incurred by members of Council in attending meetings of that body and of its Committees. It is regrettable that discussion of suggestions upon which there is a large measure of agreement in general principle, and the criticism of which is based upon the capacity of the Association to meet the cost of their adoption, should have been hampered by some rather unhappy phrasing in the resolutions and correspondence relative thereto. At all events, little progress was made.

The same comment might be passed on the report on negotiations with the Minister of Transport in regard to his sinister proposals to restrict horse-drawn traffic in the streets of our large towns, but the correspondence before the meeting included more welcome features in the appreciation expressed by the National Veterinary Medical Association of Sweden of the President's visit on the occasion of the seventy-fifth anniversary celebrations of that body and the cordial invitation extended to the Association by the Cardiff City Council to hold its 1937 Congress in that city.

Striking evidence was forthcoming that the Association goes from strength to strength in membership, and in this connection it is to be hoped that the committee to which the matter was referred will succeed in providing a satisfactory solution to the old and vexed question of accommodating partners in a veterinary business, only one of whom desires receipt of *The Veterinary Record.* We are glad to note that the opportunity was taken to endeavour, once again, to remove the erroneous impression, evidenced in certain of the letters of resignation, that the two guineas subscription to the "National" is in respect of the receipt of the Association's journal, which is, of course, to be regarded as one of the benefits accruing from membership.

From the committee reports it was made clear that the Organising Committee is doing its utmost to achieve the smooth working of the schemes for the provision of free treatment of the sick animals of poor persons, to the furtherance of which end the assurance was given that the Association will continue to do everything in its power to ensure that branches of the R.S.P.C.A. will approach all the veterinary surgeons in the neighbourhood when the establishment of a centralised clinic in their areas in contemplated.

The Appointments Committee continues to concern itself actively with the question of securing adequate salaries for members of the profession holding appointments in its various branches.

The Veterinary Officers' and Public Health Committee, which had given consideration to the North of Ireland report on the Spahlinger vaccine, has arrived at the conclusions that a case has been made out for further investigation; that the number of animals used in the Irish experiment was not enough to give statistically conclusive results, and that the general use of the vaccine should be deferred until a thorough investigation has been made. The committee recommended that the Association should take steps to consider, in the light of present-day legislation and developments, the various methods of tuberculosis eradication already in operation and that a report thereon be drawn up.

The receipt was reported of a very satisfactory reply from the Department of Local Government and .Public Health, Irish Free State, in reference to the resolution concerning meat inspection passed at the Belfast Congress.

Arising out of a joint meeting of the Veterinary Officers' and Public Health and Parliamentary Committees, all members of the profession resident in England, Wales and Scotland are to be asked to enlist the support of their local Members of Parliament for the Association's recommendations in regard to the new Order that is to take the place of the Milk (Special Designations) Order, 1923, in which the N.V.M.A. stress the need for greater uniformity in administration and put forward the Association's view as to the manner in which the veterinary provisions of the Order should be carried out.

Strong feeling was expressed by the members of Council from the area concerned and the Hon. Secretary of the Midland Division, concerning the position of the veterinary inspectorate in Shropshire, where it appeared that a change of policy seriously affecting the part-time inspectors was contemplated. A sub-committee, with power to act, was appointed to deal with this matter.

Adoption of the report of the Finance and General Purposes Committee saw the end, for the time being at any rate, of the proposal that there should be a composite subscription to cover membership of the Association and any one Division. Arrangements were reported for the early holding of a discussion with the Special House Committee of the Royal College of Veterinary Surgeons of the suggestion put forward by the N.V.M.A. as to the obtaining of premises for housing both bodies.

Presentation of the interim report of the Special Committee on Free Services gave rise to a prolonged discussion on the contemplated issue to all members of the profession of a questionnaire inviting information as to the effect, either experienced or anticipated, of such services upon the economic well-being of practitioners. Opposition to the issue of the questionnaire, however, failed to elicit any amendment to the committee's report, and the Council contented itself with granting the Chairman of the committee the power, for which he asked, to make sure that at meetings to be held for the consideration of the replies the personnel of the committee would remain representative of all sections of the profession concerned.

The first progress report from the Provisional Committee for the Annual Congress of the Association to be held at Scarborough from September 14th to 18th next, was such as should whet the appetite, not only of those who have made attendance at Congress a regular feature of their holiday programme, but of other members who have still to experience the solid satisfaction of combining recreational and social pleasure with professional enlightenment. Already it is safe to say that the Scarborough Congress will go down in our annals as one of the most enjoyable and valuable of a memorable series of meetings.

Before the termination of a long and somewhat arduous sitting, there was added to the multifarious duties of the Finance and General Purposes Committee the task of deliberating and reporting upon the question, posed by the Lancashire Division, of how far grunting, when unaccompanied by whistling or roaring, constitutes an unsoundness.

ARMY VETERINARY SERVICE

Colonel H. C. Dibben is to officiate at Army Headquarters as Director of Veterinary Services, pending succession in the appointment next month to Brigadier H. S. Mosley, D.S.O.

Lieut.-Colonel John O. Andrews, D.S.O., senior lieut.-colonel in the R.A.V.C. and A.D. of Veterinary Services for the Northern Command at York, is promoted to the rank of Colonel.

N.V.M.A. Divisional Report

CENTRAL VETERINARY SOCIETY

PRESIDENT'S ADDRESS AT THE CONWAY HALL

An address by the President (Captain J. F. Macdonald) of great historical interest to the Fellows, and a paper by Mr. Henry Gray, an accepted authority on the subject, on "The Common Diseases of Birds," provided an attractive programme for the December meeting of the Central Veterinary Society, which was held on the 5th of the month at the Conway Hall, Red Lion Square, London, W.C.

There were also present: Captain L. S. Balls, Mr. E. P. Barrett, Mr. W. Brown, Captain R. Bryden, Captain R. E. C. Bullen, Dr. Fred Bullock, Mr. H. E. Bywater (Hon. Secretary), Major Thos. Dalling, Major W. Denington, Captain H. S. A. Dunn, Mr. C. Formston, Miss C. M. Ford, Mr. L. Gabriel, Lieut.-Colonel H. E. Greenfield, Dr. Tom Hare, Mr. J. W. H. Holmes, Mr. H. D. Jones, Mr. Herbert King, Mr. N. S. King, Major H. Kirk, Mr. G. C. Knight, Miss B. L. Lock, Captain G. Dunlop Martin, Professor J. McCunn, Mr. J. W. McIntosh, Major-General Sir John Moore, Colonel W. S. Mulvey, Major G. E. Oxspring, Mr. C. R. A. Powell, Mr. W. Perryman, Miss K. W. Shedlock, Mr. J. Stewart, Captain R. J. Stow, Mr. G. M. Vincent and Miss O. Uvarov, Mr. Hugh Begg (Hamilton, Lanark), Miss Evelyn Gray, Mr. J. Hickman, Mr. J. Lowndes (Canada) and Mr. E. Wallace were present as visitors.

The Hon. Secretary announced that the account of the Annual Dinner of the Society, which had been published in *The Veterinary Record*, constituted the "minutes" of the last meeting, and this record was confirmed and signed, on the proposition of Mr. Holmes, seconded by Captain Stow.

Correspondence.—(1) From Mr. G. P. Male, Professor James Macqueen, Captain S. J. Motton, Mr. J. W. Pritchard (of Brighton) and Professor G. H. Wooldridge apologising for their inability to attend the meeting.

(2) From the General Secretary of the N.V.M.A., enclosing correspondence relative to the establishment of a clinic, within the London area, for the treatment of the sick animals of poor persons.

The Fellows went into committee to consider this matter, and, on the resumption of open meeting, the following resolution was passed: "That a letter be addressed to the N.V.M.A., requesting them to ask the R.S.P.C.A. to get in touch with their local branches all over the country, to ensure that when the establishment of a centralised clinic in their areas is contemplated, all the veterinary surgeons in the neighbourhood should be approached."

It was further agreed that, in regard to a specific complaint contained in the correspondence before the meeting, two members (named) should investigate the matter with a view to furnishing proof of the allegations made when the resolution went forward.

Mr. J. W. Holmes now moved: "That the N.V.M.A. consider again the question of free clinics for the treatment of sick animals of the poor, with a view to the possibility of organising their own free clinics."

The motion having been seconded by Captain L. S. Balls and supported by Mr. Henry Gray, Mr. C. R. A. Powell proposed: "That every veterinary surgeon should be allowed to run his own free clinic or cheap clinic and advertise it in the Press."

At this point Mr. J. W. McIntosh rose to say that the question of clinics for the animals of poor persons had been well discussed on many occasions by professional bodies before, and it was only after considerable difficulty that the N.V.M.A., after reference to the Divisions, had come to certain conclusions and made certain arrangements with the R.S.P.C.A. regarding it. Therefore he thought it was rather unfortunate that they should be discussing that matter again, whatever their views might be, for the two schemes now in operation had the approval of the parent body. They all realised that the animals of the poor required attention; the public demanded that attention, and whether the profession liked it or not, such provision was going to continue. It was thought by many members of the profession that if the profession, as a whole, was not prepared to give practical support and co-operation in schemes of the kind now in operation, then they were going to find quackery established throughout the country, to the detriment of the profession. It was only by the active and generous participation of all members of the profession available that the schemes could be made a success. If any feature of the schemes should be found to be unsatisfactory, then by approaching the proper bodies and by combination they could probably remove them and improve the schemes. He proposed, therefore, that the meeting should confine itself to the letter before them, which had given rise to that very wide discussion.

Mr. McIntosh's proposal was seconded by Lieut.-Colonel H. E. Greenfield, who expressed the view that Mr. Holmes' proposition was out of order from the point of view of the profession, because the "National" had pledged itself to work with the R.S.P.C.A. on certain lines. He therefore contended that while the present schemes were in their early stages, they should not put forward a new one, but should aim at

working with the R.S.P.C.A. for the time being, at any rate, until such time, if it should unfortunately arise, as the "National" found it could not carry on.

Dr. J. McCunn observed that he wished to say, in reply to Colonel Greenfield, that if any scheme, put forward to meet a public demand, was tried and found to be a good one, it should be followed up; if, however, a scheme was found not to be working satisfactorily, the sooner disagreement with it was expressed, the better. If the schemes now in operation were wrong—and he took the view that they were—it was better to "scrap" them before they became too big, too well established, and beyond control by the profession.

Dr. Tom Hare thought that the fundamental question had been overlooked. The suggested schemes were of secondary importance. The veterinary surgeon wanted to know to what extent the functions of private practice might share in the wide-scale advertising which was now conducted by many institutions possessing veterinary surgeons on the staff. It appeared desirable that a new technique in approaching the public should be devised. This was a medico-legal and ethical question as well as a matter of the practitioner's bread and butter. Might he suggest that the Council of the Society should arrange a meeting at which they should have contributions from Dr. Bullock, dealing with the medico-legal aspect of the question, from colleagues who were general practitioners, as well as from some of those who had experience of dealing with the R.S.P.C.A. and kindred bodies?

Mr. Holmes, withdrawing his motion, supported Dr. Hare's proposal that a special meeting be called to consider the question and, Captain Balls having seconded, the proposition was carried *nem. con.*, and it was further decided that the special meeting be held on the third Thursday in January.

Nominations.—The following were nominated for election as Fellows of the Society: Mr. Campbell Dickson, 23, Manor Road, Romford (Proposer, Mr. R. Bennett; Seconder, the Hon. Secretary); Mr. W. Grant, Bank Chambers, Chelmsford (Proposer, Colonel W. S. Mulvey; Seconder, the Hon. Secretary); Miss K. M. Sanderson, Institute of Agricultural Parasitology, Winches' Farm, St. Albans (Proposer, Sir Frederick Hobday; Seconder, the Hon. Secretary), and Captain P. W. Walker, 7, Whitehall Place (Proposer, Captain W. G. Wragg; Seconder, Captain V. Boyle).

Morbid Specimens and Cases of Interest

Major Hamilton Kirk exhibited two specimens, the first being the heart and kidneys of an adult greyhound which, said Major Kirk, suddenly fell dead during a race. The heart weighed 13 oz. and the kidneys approximately ½ lb. each, which he believed to be excessive weights for either organ. Large organised deposits would be seen about the mitral valves, which presumably indicated that this dog suffered from endocarditis at some time or other. In consequence of the imperfect closure of the valves, hypertrophy of the heart gradually ensued, as they could see there.

In view of the large kidneys, one had to conjecture whether they were affected by chronic nephritis, which in turn caused the heart complication. Sections had not yet been examined histologically. The sudden death was most likely caused by blocking of a coronary artery by an embolus detached from the valvular vegetations.

Osteoma?

Major Kirk said that the other specimen was removed from the skin of a Sealyham's back. Upon dissecting this out he was surprised to find that his knife appeared to be touching bone. He thought at first it was an osteoma, in which case it would have been something of a rarity. Mr. Orr, of the Royal Veterinary College, examined it and reported as follows: "The specimen appears to be a definite case of calcification and not an osteoma, as I find that the calcified material shells out from the cavity, leaving quite a well-defined capsule around it. With regard to the original nature of the lesion, one can point out a possible suggestion: it may originally have been an abscess as you suggest, or, on the other hand, the calcified material may represent sebum which had collected in a sebaceous cyst."

Incidentally, the owner of this dog had, in the first instance, sought the advice of a quack, who told him that a serious operation was involved, necessitating a general anæsthetic, and that the dog would be two or three weeks in hospital afterwards. The cost was to have been several guineas. Actually, the swelling was dissected out within about 15 minutes by the aid of a local anæsthetic, and the dog restored to its owner at once. This, concluded Major Kirk, was an instance of how the quack preys upon the public.

Captain R. J. Stow exhibited two radiographs, saying that there was nothing specially remarkable about them, except that, in his opinion, they were wonderful skiagraphs. The condition shown was simply a dislocation of the elbow in a cat, and the feature of the radiographs was not so much the actual bones of the leg, but the way in which the sternal cartilages were shown up. The doctor who took them was very surprised that structures presumably cartilaginous should have come out so well.

Another point of interest was the manner in which the clavicle was shown, in front of the shoulder joint. At one time he was doubtful about the possession by the cat of a clavicle, but he had been convinced ever since a sportsman of his acquaintance had pointed out that the tiger has a clavicle.

Major G. E. Oxspring recounted (with exhibit) cases of equine debility due to infestation of the pyloric portion of the stomach with the parasite *Trichostrongylus axei*. [This contribution, together with the discussion upon it, is transferred to the clinical section of this issue.—*Editor.*]

Captain Balls enquired if any Fellow could inform him if there was any cure for deafness following distemper in the dog.

There being no immediate reply, Major Kirk asked if Major Dalling would give them his opinion as to the condition of the kidney he (Major Kirk) had exhibited.

Major Dalling replied that it was almost impossible to tell, without a microscopical examination.

Major Kirk, referring to the skiagraphs exhibited by Captain Stow, said that he had radiographed dozens of cats and he had never yet seen a clavicle; indeed, when examining the radiographs prior to the meeting, he had enquired of Captain Stow, "What is that bone in front of the shoulder joint?"

Dr. J. McCunn, taking up the point raised earlier by Captain Balls, enquired of him if the deafness following distemper in dogs was due to internal, middle, or external ear disease. In his view, in middle or external ear disease, the deafness was due to catarrh; in the latter, something could be done, but in middle ear disease there was very little one could do owing to the inaccessibility of the membrana tympani. Internal ear deafness was generally associated with changes in the nervous mechanism.

In reply to Captain Balls, whose response took the form of a further question, Dr. McCunn thought that in some cases the deafness was similar in origin to the blindness sometimes met with, due to brain lesions.

Lieut.-Colonel H. E. Greenfield observed, in connection with Captain Balls' enquiry, that he did not know if the suggestion was of any value, but it might at least interest them to know that endrine, produced by the Petrol Agar Company, had given great relief to a friend of his who suffered from deafness and who had recently had a severe attack of sinusitis.

Presidential Address

The President (Captain J. F. Macdonald), having expressed his thanks to those who had contributed to the foregoing section of the meeting, proceeded to give his Address from the Chair, which was in the following terms:—

Custom decrees that your President shall give an address at the December meeting and, fortunately for that official, custom has also arranged that this address shall never be discussed, thereby affording the speaker a certain latitude in his choice of remarks. There is, however, no record of a past-President who has abused this privilege.

While in an idle moment I was thinking of the giants of the profession who had occupied the Chair in the past, it occurred to me that it might be a graceful gesture on our part, if we devoted a few minutes of our time to-night to the memory and works of these famous men who were responsible for founding our Society. So, with your permission, I will take you from this year of grace, 1935, and transplant you to a room near Portman Square in the palmy days of Victoria the Good, where the first meeting of the Central Veterinary Medical Society was held. I cannot do better than read you the opening paragraph of the first minutes: "On Tuesday, October 4th, 1870, the first Ordinary General Meeting was held at 7 o'clock in the evening in the rooms of the West End Home for Working Boys, 15, Lower Seymour Street, Portman Square."

Picture to yourselves, then, this club-room filled with no less than 60 members of the profession all interested in this function—the birth of a great and powerful society. There are Mavor, Moore and Fleming, with their full, flowing beards; Roalfe Cox and Rowe, who sport the fashionable Dundrearies, and others who appear to have been devotees of the mutton-chop variety. We know this, because in 1870 the Society photograph album existed, and in it we can still see the likenesses of these Victorians—some rather faded now, it is true—but they seem to bring us into closer contact with these men, who are but names to most of us. This meeting, although the first general meeting, was apparently preceded by a Council meeting held on September 22nd of the same year.

The second general meeting saw the Fellows in new surroundings. I am unable to discover whether the professional men objected to the working boys, or whether it was those youthful toilers who disapproved of Messrs. Fleming and Co., but it is a fact that the second and subsequent meetings took place at 10, Red Lion Square, and continued there until an unsympathetic Council threw us forth upon the streets of London, W.C.1, to find a new home. It is regrettable to note that the attendance dwindled; whereas 60 attended meeting No. 1, there were only 21 at the second and 15 at the third. Evidently that apathy, which has always been our weakness as a profession, is of old standing and has its roots deeply embedded. The entrance fee was £2 2s. and the annual

subscription £1 1s., but one has to remember that the veterinarians of those days were rich men in comparison with those of to-day.

Let us return to this historic first meeting. The President, Geo. Fleming, gave an address detailing the objects of the Society and adding that similar societies had already been formed in the provinces. He mentions a Mr. Greaves, of Manchester, as being the man responsible for starting this important movement, and it seems to me that it would be a fitting tribute to this gentleman if the "National" were to take some steps to keep his memory green.

Papers were read by F. J. Mavor and William Hunting. The former dealt with the effect of drugs upon the equine temperature, while Hunting's subject was his favourite one, "The Horse's Hoof." Abstract reports of this meeting were sent to many papers, including *The Lancet*, *The Farmer*, *Bell's Weekly Messenger*, *The Field*, *The Veterinarian*, and to Scottish and Irish agricultural papers.

The actual agenda appear to be almost identical with those of to-day. *Post-mortem* specimens were a strong (though I trust not too strong) item, and it is just possible that the care-free disposal of these may have unsettled the more sensitive members of the Working Boys' Club and led to a change of meeting place. (Laughter.)

The discussions were well maintained and covered much ground. The subjects were, of course, mainly equine, but one finds papers on bovine and canine diseases also. Glanders and rabies were prevalent and came in for considerable notice. On one occasion when the latter disease was under discussion and after many speakers had testified to the numerous cases they had seen, our old friend James Rowe arose and declared that the whole affair was a newspaper scare and that rabies in London simply did not exist. Those who knew the old man, can well picture this scene.

In 1876 we read a description by the elder Woodger of a horse ambulance which he had designed. It sounds very similar to those in use now. He refers to it as being particularly useful for collecting horses which had collapsed in the street suffering from ruptured psoas muscles. Presumably this refers to cases of azoturia.

In the same year (1876) Mr. G. South, senr., described an operation on a seven-year-old bay gelding for cystic calculus. The horse was chloroformed and the operation wound made in the perineal region, through which was removed a calculus 7 in. by 5 in. and weighing 13 oz. The horse did well. Roalfe Cox assisted at the operation, which is described as almost bloodless.

Professor Axe, in 1878, described a successful case in the horse, where he performed paracentesis thoracis. His after-treatment consisted of withholding drinking water and administering turpentine.

There is also an amusing story of a Fellow, who arrived late at a sale, to find the horse he wanted already being shown. Hearing the auctioneer about to hammer at 65 guineas, he hurriedly waved his stick, and obtained what he believed to be a cheap horse at 66 guineas. There was, of course, the inevitable "snag"; the previous bid had been 165 guineas and the auctioneer refused to listen to explanations, but our colleague was made of stern stuff and resolutely refused to pay.

Professor Walley, of Edinburgh, read a paper at one meeting, which shows that even in the 'seventies the Scottish invasion was beginning.

The first printed list of Fellows, I can trace, is for the year 1878-79, on which there are 60 names, mostly London men, but one sees there are Fellows in Rochester, Windsor, Brentwood and Grantham. The Society is now a sturdy youngster of nine years, and here let us leave it and return for a moment to the founders, whose names I would like to read out to you, although I cannot guarantee the list to be a complete one. If I should dwell on one or two of the names it is only because these are the men I had the privilege of actually knowing. G. Armatage, J. Burrell, A. Broad, J. Broad, W. Clark, W. Field, G. Fleming, T. W. Gowing, senr., T. W. Gowing, junr., W. Hunting—(a truly fine type this. See him examining the nervous student and carefully suggesting the correct answers to the questions until he sees the unfortunate youth has lost his nervousness. William Hunting is one of the immortals)—F. Jarvis, J. Jarvis, C. Lowe, A. Mavor, F. J. Mavor, J. Moore, C. Offer, T. Salisbury Price—(I can see him as he used to sit at the end of a sprig at our dinner in the Holborn Restaurant, his rather generous figure shaking with silent laughter. He is no longer with us, but his descendants are here to-day. One grandson has already adorned the chair of our Society. I will venture to prophesy that the other will occupy this position in the near future. [Hear, hear.] His daughters, Mrs. Wooldridge and Mrs. King, are foremost in any good work connected with the profession, especially the Veterinary Benevolent Society, and his sons-in-law need no eulogy from me) [applause]—F. Riddler, James Rowe—(who has so recently left us and who took an active part in the Society up to his death a few years ago. He was the last of the founders, and I could wish he had been here to-night to give us his memories of those days)—and, lastly, J. Woodger, senr., and E. Woodger.

The first men to be elected were: F. T. Stanley, J. Hall, T. Hetherington, C. H. Martin, F. W. Wragg, all of London, and as non-resident

Fellows (as they were called then), W. Bentley, of Margate; H. Simpson, of Windsor; and H. Lawrence, of Romford.

The first President was George Fleming, the second F. J. Mavor, then followed J. Roalfe Cox, T. W. Gowing, Wm. Field, Professor Axe and H. Batt. The Treasurer during the period under review was J. Woodger, senr. The Secretaries, first G. Armatage for two years, then James Rowe for eight years, next W. Hunting for two years, and lastly A. Broad. The Secretary's job has never been a sinecure, but in 1870 he had to take rough notes of the meeting and then in his leisure hours copy it into the minute book in full. They may not have presented Victory Medals, but the Secretaries certainly earned them. (Laughter.) Some 50 years after, James Rowe did receive the Victory Medal, which he had so justly earned. As far as can be ascertained, the man mainly responsible for establishing the Central Veterinary Society was George Armatage, the first Secretary, and I would suggest to you that we might in future place his name on the cover of our List of Fellows as Founder of the Society. (Hear, hear.)

The first Hon. Fellow was Professor Tuson, the second to have this honour conferred being Professor Walley.

To Dr. Bullock I am indebted for the following information with regard to various other veterinary societies in this country. He says:—"It was, I think, T. W. Mayer who first proposed the establishment of county veterinary societies in 1846, two years after the establishment of the R.C.V.S. He had been the most active worker in obtaining the first Royal Charter. It was Thomas Greaves, of Manchester, who first succeeded in getting a veterinary society started at Manchester in 1852 with Mr. John Lawson as President. That society was, however, only formed for a special purpose and did not continue. The first provincial veterinary association to be formed was the West of Scotland in 1858, followed by ,the Aldershot Army V.A., 1861; the Lancashire, 1862; the Yorkshire, 1863; the North of England, 1863; the Liverpool, 1864; the Central Scotland Association, 1865; the West of England, 1865; the Midland Counties, 1866; and the Central V.S. in 1870 (26 years after the incorporation of the R.C.V.S.)."

Two Present-day Problems

If there is time, I would like to say a few words on two present-day problems, but in view of the fact that Mr. Gray is going to read us a most instructive paper this evening, I will only touch lightly on these topics.

(1) *The Free Clinics.*—This is a matter which is assuming considerable importance in the towns of this country. They started as quack establishments, which were simply a means of the unqualified man obtaining sufficient experience and confidence to open up in general practice for himself. Whether we regard these clinics from our own point of view or from that of the animal concerned, there is much to be said against them. We have now an attempt by the R.S.P.C.A. to run a number of free clinics in charge of qualified men, and this is undoubtedly a considerable advance on the original quack dispensary. What the future holds it is difficult to say, but the movement is in its infancy and must grow very considerably in the years to come. It may develop into a panel system, such as is practised in medical circles already, or it may possibly become a vast organisation of general hospitals staffed by house surgeons and attended by local practitioners as operating surgeons, radiologists, etc. There is a huge amount of money subscribed annually by the British public to these many animal societies, and I feel that it is only right to the subscribers and to the animals in question that a better use should be made of it. It appears to me that a large percentage of the money subscribed is wasted through lack of proper organisation. There are too many of these societies, all with their separate offices, buildings, staffs and expenses. Properly co-ordinated, they could effect much better results than are achieved under the present method, which seems mainly notable in that it is not methodical.

Number of Veterinary Students.—The other matter to which I wish to draw attention is the extraordinary increase in the number of veterinary students. At the present moment there are no less than 1,100 at the various colleges. This is due to various causes, amongst which one might enumerate—the women students; the Indian students; the slump in industry and commerce; the increase in small-animal practice; the overcrowding in other professions (medical, dental, etc); and the erroneous ideas of the incomes made by veterinary surgeons. How long we can absorb the increasing number of students is the question which must soon arise, if, indeed, it has not already arisen. Not only has the number increased tremendously, but it continues to increase by leaps and bounds each year.

I would ask you to consider these two important questions at your leisure, for I feel sure they are likely to be of vital importance to you in the future.

In conclusion, may I thank you for the honour you have bestowed upon me in electing me to the Chair, and also for the patience with which you have listened to my address. (Applause.)

Paper.—At the conclusion of his Address, which was enthusiastically received, the

President called upon Mr. Henry Gray to read his paper entitled: "The Common Diseases of Birds."

In asking Dr. Tom Hare to open the discussion, the President said that he was sorry to say that, through lack of time, Mr. Gray had been unable to read his paper in full, but he was sure that all would agree with him, after hearing that part—the larger portion—that the essayist had been able to present to them, that it was highly desirable that so splendid a contribution should be published in full in *The Veterinary Record*, because it was going to prove a very useful "book of reference" for anyone dealing, or who might be called upon to deal, with the diseases of birds. (Hear, hear.)

[The full text of Mr. Gray's paper and a report of the discussion upon it (much curtailed for want of time) will be published in an early issue of *The Veterinary Record.—Editor.*]

Votes of Thanks.—The customary votes of thanks to the essayist, to those who contributed to the clinical section of the proceedings, and to the President for his conduct in the Chair, concluded a most interesting meeting.

H. E. Bywater, *Hon. Secretary.*

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Jan. 25th.—Meeting of the Scottish Branch, N.V.M.A., at Perth, 2 p.m.

Jan. 31st.—Annual General Meeting of the Yorkshire Division, N.V.M.A., at the Hotel Metropole, Leeds, 3 p.m.

Jan. 31st.—Annual General Meeting of the Royal Counties Division, N.V.M.A., at Reading, 5 p.m.

Jan. 31st.—Annual Dance, Royal (Dick) Veterinary College, Edinburgh.

Feb. 6th.—Issue of Voting Papers, R.C.V.S. Council Election, to overseas members.

Feb. 6th.—Meeting of the Central Division, N.V.M.A., Conway Hall, Red Lion Square, W.C.1, 6.30 p.m.

Mar. 13th.—Annual Dinner and Dance of the Yorkshire Division, N.V.M.A., at the Guildford Hotel, Leeds.

April 1st.—R.C.V.S. Annual Fee due.
R.C.V.S. Committee Meetings.

April 2nd.—R.C.V.S. Committee Meetings.

April 3rd.—R.C.V.S. Committee and Council Meetings.

May 7th.—Last day for nominations for election to R.C.V.S. Council.

May 21st.—Voting Papers issued, R.C.V.S. Council Election.

May 28th.—R.C.V.S. Council Election Voting Papers due.

June 4th.—R.C.V.S. Annual Meeting and Luncheon in Edinburgh.

June 11th.—D.V.S.M. Examination begins.

June 24th.—R.C.V.S. Committee Meetings.

June 25th.—R.C.V.S. Committee Meetings.

June 26th.—R.C.V.S. Committee and Council Meetings.

June 29th.—R.C.V.S. Membership Examinations begin.

Sept. 14th-18th.—N.V.M.A. Annual Congress, Scarborough.

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R.C.V.S. Council Election

The election of eight Members to the Council of the R.C.V.S. will take place at the Annual Meeting to be held in Edinburgh on Thursday, June 4th. Nominations may be received up to Thursday, May 7th. The Members retiring by rotation this year are Professor Buxton, Mr. G. H. Locke, Mr. T. M. Mitchell, Sir John M'Fadyean, Dr. Share Jones, Dr. Sheather, Mr. Willett and Professor Wooldridge, all of whom have been nominated for re-election with the exception of Dr. Sheather, who has intimated his intention not to seek re-election.

The Voting Papers to Overseas members will be issued at the beginning of February.

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PERSONAL

Appointment.—Mr. C. J. Pugh, M.R.C.V.S., of Chepstow, has been appointed Chief Veterinary Surgeon to the Ocean Colliery Company at Treorchy. He will have control of 1,000 ponies.

"Mr. Pugh has developed a large practice in agricultural and other circles in Chepstow district, and his departure is much regretted," says *The South Wales Argus.* "He is very popular in the town and will be missed in many directions. A thorough sportsman, Mr. Pugh is a keen cricketer and played regularly last season for Chepstow."

Forthcoming Marriage.—Warnock—Sheather: The engagement is announced between John Lyon, eldest son of Mr. and Mrs. R. B. L. Warnock, of "Shields," Courtleigh Gardens, N.W.11, and Kitty, daughter of Dr. A. Leslie Sheather, D.Sc., M.R.C.V.S., and Mrs. Sheather, of "Wroxton," Chorleywood, Herts.

Nature (January 18th) makes the announcement that M. Ramon has been elected Member of the French Veterinary Academy in the Section of Zootechnics and Animal Industry. M. Ramon is the brilliant young veterinarian (known especially for his work on diphtheria and tetanus immunisation) who is assistant director of the Pasteur Institute, Paris.

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R.C.V.S. OBITUARY

Edwards, William Watkin Herbert, Cusop Cottage, Craven Arms, Salop. Graduated London, July 16th, 1901; died January 19th, 1936, aged 62 years.

Murray, Edwin, Norton, Yorks. Graduated New Edinburgh, May 28th, 1890; died January 19th, 1936, aged 66 years.

GENERAL OBITUARY

Captain S. R. Douglas, F.R.S., F.R.C.P.

With deep regret we have to record the death, which occurred on Monday last at his London home, of Captain Stewart R. Douglas. There are few outside the profession who have endeared themselves to those of its members whom he knew as much as Douglas. To him was the incomparable gift of understanding, of sympathy and above all of encouragement. His wide knowledge born of deep reading, experience and travel made him a marvellous teacher and an excellent companion, and his kindly nature a beloved friend.

His loss to medical research is great and "only those who knew him and worked with him can realise what his loss means. . . ."

To know Douglas was an education, for he was, besides an eminent scientist, as was well testified in *The Times* of January 21st, a wide traveller and naturalist. He loved all animals and it is largely due to him that the Small-animal Breeding Department now situated at Mill Hill, and which had its inception at the National Institute for Medical Research at Hampstead, owes its existence. Douglas realised, probably as soon as anyone, that successful experimental work cannot be carried out with unhealthy animals, and his doctrine has not only borne fruit in the Institute he loved so well and served so loyally, but is gradually becoming recognised.

His early medical career was spent on the Plague Commission of 1899, with the China Expedition in 1900 and 1901 and investigations in vaccine therapy.

More recently, and since his appointment as Director of the Department of Experimental Pathology in the National Institute for Medical Research, he has become well-known to the veterinary profession. He will be remembered as Chairman of the Tuberculosis Committee of the Medical Research Council, as a member of the Foot-and-Mouth Disease Research Committee of the Ministry of Agriculture, and particularly for his work on the Scientific Committee of the "Field" Distemper Fund. He was for many years a member of Council of the Section of Comparative Medicine of the Royal Society of Medicine and was elected to the Chair two years ago.

This brief list of some of his activities seems to the writer, who was privileged to know him well, as a mere skeleton of his work and interests. His knowledge of men and things generally was encyclopædic and his advice, frequently sought and invariably accepted, was never refused by him. A feeling of desolation exists among his friends and colleagues, for they have lost a dear friend, and the profession a man who understood its difficulties.

Captain Douglas leaves a widow and a married daughter, to whom we extend our heartfelt sympathy.

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IN THE COURTS

Anthrax Prosecutions: "A Warning".—In inflicting fines upon farmers for failing to give proper notification to the police of cases of suspected anthrax, the Chairman of the Withernsea Bench said that he hoped the prosecutions would be regarded as a warning to farmers. In one case the defendant had cut the throat of a cow that had been ailing for two days and the blood, running into the fold yard, was drunk by two sows, which later showed symptoms of anthrax.

The prosecuting solicitor said that if a farmer was in doubt in a matter of that sort he could communicate with the police, who would call in the County Veterinary Surgeon without charge. The Chief Constable had asked the Farmers' Union to bring that fact to the notice of the farmers.

Breaches of the Swine Fever Order.—The excuse that he failed to understand the forms served on him proved of no avail to a Cornish farmer who was fined £20 at West Kerrier Sessions for breaches of the Swine Fever Order. Defendant was first charged with the unlawful movement of seven fat pigs out of an "infected place" without a licence, and also with the unlawful movement into an infected place of two sows. Defendant pleaded "Not guilty," and in evidence said he did not understand the form he received from the police inspector. As the Ministry of Agriculture's veterinary inspector did not reach the farm until the following afternoon, and then serve him with forms, witness thought he was in order in having the fat pigs removed.

Defendant was further charged on two counts with having between December 16th and January 5th moved two sows and a sow and ten farrows out of infected places without a licence. Defendant, who entered a plea of "Guilty," said he misunderstood the regulations, not being aware that it was unlawful for him to move pigs from one of his farms to the other.

Addressing defendant, the Chairman said it seemed to the Bench that there was absolutely no excuse for his conduct, and that they hoped their decision, a lenient one, would be such a reminder to him of the absolute need of protecting the public that as far as he was concerned nothing of the sort would ever occur again.

Unsound Meat at Leeds.—Giving evidence in a case heard before the Leeds Stipendiary Magistrate, in which a Harewood butcher was fined £10 and costs for depositing unsound meat for the purpose of sale, Mr. E. F. McCleery, Assistant Veterinary Officer for Leeds, spoke to being called to examine a carcase by the butcher in the wholesale meat market with whom it had been deposited for sale on commission. The carcase was in an exceedingly bad state, and he seized the meat, which was subsequently condemned by the Stipendiary Magistrate. It was perfectly obvious to anyone, said Mr. McCleery, that the meat was bad. Afterwards he saw the defendant, who told him that on the previous day he had dressed two carcases at Wetherby. The first beast was condemned by the inspector at Wetherby. Defendant went on to say that after the inspector had gone he began to dress the second beast, and noticed that that also was diseased but thought he would not trouble his own inspector and would send it to Leeds.

Mr. Smailes pointed out that the defendant had been fined £10 and costs, amounting altogether to £14 8s., at Wetherby, for failing to notify the local authority of the finding of disease on slaughtering an animal. That fine was imposed in connection with the same beast.

The solicitor for the prosecution said that the Leeds authorities regarded this as a very flagrant offence.

The Stipendiary Magistrate: "I think it is a serious offence, and it has subjected the defendant to a penalty of £20; but I do take into account the fact that over this very business he has already been fined £10 and costs."

A Distemper Relapse: Purchaser's Claim Fails.—A claim for £20 damages in respect of a Sealyham puppy that had a distemper relapse failed at Westminster County Court when Judge Dumas gave judgment, with costs, for the vendor of dog.

The purchaser and his wife said that the vendor told them the puppy had recovered from distemper. They insisted on a veterinary certificate, but next day the puppy was found to be suffering from distemper, and its treatment put them to considerable expense.

The veterinary surgeon who gave the certificate said that the puppy showed no sign of distemper when he examined it. A chill might cause a relapse.

Judge Dumas: "Plaintiff unfortunately bought a dog liable to relapse, and I think that relapse took place."

. . . . . .

Sufferings of a Greyhound Pup.—The Mansfield magistrates imposed a fine of £2, with £3 costs, and disqualified from holding a dog licence for two years, the owner of a six months' old greyhound puppy found lying trembling in a gutter, unable to stand. Thinking it had been injured, a "Good Samaritan" took the pup home, when it ate a pound of meat ravenously. When the dog was professionally examined, it was found to have been grossly neglected. It could not walk properly on its pads, but got along instead on the fetlock joints, which were worn to the bone through contact with the ground. It was also suffering from mange, emaciation and paralysis through being neglected, and not having sufficient food. It had, in addition, curvature of the spine and deformity of the limbs. As soon as the veterinary surgeon saw the animal, he ordered it to be destroyed.

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LEVERHULME RESEARCH FELLOWSHIPS, 1936

Application is invited for (i) Fellowships and (ii) Grants in aid of research. The Fellowships are intended primarily to provide for senior workers a period of freedom from routine duties during which they may undertake or complete researches which are being delayed through the pressure of other work. The Grants are intended to provide for senior workers, who may not require release from their ordinary duties, such assistance as may be necessary to enable them to expedite or complete their work. Neither Fellowships nor Grants are awarded to graduates doing research with the object of obtaining higher degrees. Applicants must be British-born and normally resident in Great Britain.

The duration of the grants will not normally extend over more than two years and the amount will depend on the nature of the research and the circumstances of the applicant.

Any subject which may add to human knowledge may be proposed for a Fellowship, but preference is given to subjects in which other provision for research is inadequate.

Forms of application may be obtained from the Secretary, Dr. L. Haden Guest, Leverhulme Research Fellowships, Union House, St. Martins-le-Grand, London, E.C.1.

Applications must be received on or before March 1st, 1936. Awards will be announced in July, and the Fellowships or Grants will date from September 1st, 1936.

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"THE MARRIAGE OF PUBLIC HEALTH AND AGRICULTURE"

The subject of the intimate relationship of two such outstandingly important collateral interests of veterinary science as public health and agriculture is of such first-rate public concern and is indirectly of such importance to the future of the veterinary profession that the thoughtful and concise analysis of the situation made in a recent leading article in *The Lancet* is reproduced below as being certain to be read with profit by a large body of our members.

"The phrase is Mr. Bruce's. He was speaking of the wastefulness of widespread malnutrition at a time when farmers long to produce more crops; he was pointing out that agriculture and public health have one great need in common; and he was urging the governments of the world to divert their subsidies from schemes for restricting production to schemes for enlarging consumption. Here in England this policy finds one of its best exponents in a member of our profession who is also in close touch with farming, Sir John Orr of the Rowett Institute at Aberdeen. In his address to the British Association last September he admitted that price-raising methods such as quotas and tariffs have saved British agriculture from the full effects of the world economic crisis, but maintained that they can be justified only as emergency measures. At a time, he said, when there is a so-called glut of all kinds of food, the continued existence of diseases due to malnutrition shocks the public conscience, and public opinion forces an increase of the already heavy expenditure on social services in an endeavour to get them eliminated. Cheaper food would reduce the cost of such services, for it means less poverty and less disease due to poverty; and Sir John went on to demonstrate that agriculture, as much as public health, stands to gain from an expansive programme. Inquiries jointly made by the Rowett Institute and the Market Supply Commission show that consumption of the 'protective' foods—milk, eggs, fruit and vegetables—rises uniformly with income, and that generally speaking it is not until we reach families with about £1 a week per person that the diet, according to modern standards, is adequate for maintaining health. At present some 20 million of the population are below this scale and if everyone in the country were brought up to the £1 5s. scale, which probably represents an optimum, the market for food would be 20 per cent. larger. He calculates that if we all had as much food as we ought the percentage increases in consumption would be: milk 42, butter 27, eggs 28, fruit and vegetables 53—which 'gives an indication of the limit to which agriculture could be developed in this country without reducing imports and therefore without prejudicing our export trade or the interests of our overseas investments.' The Bishop Auckland potato experiment, in which unemployed men bought their potatoes direct from a depôt at 4d. instead of 7d. a stone, showed that there is an ample market for food at lower prices and indicated one way in which these prices can be attained. The better organisation of distribution by marketing boards could, in itself, lower retail prices, and the remaining difference between the price the public can pay and the price the farmer must charge should be made good, in Sir John Orr's opinion, by direct subsidies to these boards from the State—subsidies to be regarded as more in the interests of public health than of agriculture. 'All the money going to the farmer flows back immediately to the towns, invigorates industries and reduces unemployment. None of it is lost to the country. . . . The next five years should be devoted to a great constructive policy, based on increased consumption and better utilisation of our wealth, a policy designed to bring about a prosperous agriculture, a better fed people, and increased internal trade.'

"A voice crying in the wilderness? No. For when Mr. Boothby brought forward some of these

arguments in the debate on the Address last month the Government spokesman, Lord Eustace Percy, took pains to show that the investigations on which Sir John Orr's conclusions are founded were made at the instance of the Government itself, and published in order to awaken public attention to the need for, and possibilities of, a policy of nutrition. Lord De La Warr, as Parliamentary Secretary to the Ministry of Agriculture, told the League of Nations' Assembly in September that it is not enough to resist a policy of restriction; something more positive is needed —namely, deliberate action. On December 18th, Lord Eustace Percy, receiving a deputation from the Children's Minimum Committee, said that a broad nutrition policy must be one of the main aims of social administration in the immediate future; indeed, he went further and declared that on the main issues there was no conflict between the views of the Government and those of the deputation. If this is true it suggests a definite change of front—a determination, now that trade is recovering, to think in terms of permanent social advantage rather than the requirements of crisis. For the deputation's memorandum set out clearly their demand for a more positive approach to the problem of nutrition, their discontent with the abandoned scales of the Unemployment Assistance Board, their anxiety about the painful reports that come from distressed areas and distressed homes, and their belief that 'a great deal more can be done immediately by a more generous development of existing services to safeguard and improve the health of the two sections of the community for whom proper nutrition is of supreme importance —children, and mothers during the child-bearing period.' The sharpest edge of the depression, they said, is falling on families with young children, and they outlined schemes by which this national evil can at least be mitigated. Lord Eustace Percy was right when he replied that a really broad policy can hardly be based on attempts to deal merely with cases of poverty, and that its most important aim must be rather to promote the establishment of sound normal standards of nutrition and physical fitness. But he might equally well have said that such a policy must be based on the recognition that proper feeding is the first necessity for national health—a necessity more urgent and compelling even than good housing or the control of infection or any other of our hygienic aims. At present we are wasting our agricultural resources and we are wasting our human material. In Sir John Orr's words, we need a national food policy, into which both agricultural and public health interests can be fitted and reconciled.

"The science of nutrition has shown the way to a more economical economy, to a more tolerable state of society. It has revealed deficiency diseases; it has described the means whereby they can and must be prevented.[1] But we shall be very much mistaken if we look on this science as merely the analysis of starvation; we should think also of the constructive contribution it may make to human progress. Dr. James McLester took this as his theme for the presidential address[2] he gave to the American and Canadian Medical Associations last summer, when he spoke of the highly significant discovery that under certain circumstances an animal's life may be greatly improved by the addition of appropriate foods to a diet previously thought satisfactory. In 20 years, he said, Osborne and Mendel were able to treble the growth-rate and double the standard weight of their albino rats; they produced what was in fact a new species, simply by intelligent alteration of the rations. Can the same thing be done for man? The Chinese in Hawaii, the Japanese in San Francisco, grow larger than their compatriots in China and Japan. In this country F. G. Parsons believes that hygiene and better food have raised the height of the upper classes, while H. H. Bashford reports that Post Office messengers get bigger (though not necessarily brighter) from year to year. Where must the process stop? 'The mere survival of a community,' Sir Gowland Hopkins has remarked, 'is too often taken as proof that the nutrition of its constituent individuals is adequate'; but 'the community, while managing to survive, may yet be functioning at levels far below those possible to its innate capacities.' In other words, McLester says, adequate and optimum are not synonymous, and it may be possible, through improved nutrition alone, to bring mankind to a higher level of physical development—to a larger stature, greater vigour, increased longevity, and a higher level of cultural attainment. Ultimately this is a problem of education and of government; and the first step towards solving it is to ensure that the marriage now arranged between public health and agriculture shall shortly take place."

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PLAGUE-INFECTED RATS

Dr. W. N. Frazer, Medical Officer of Health for Liverpool, stated recently that there was no further cause for alarm over the fact that some weeks ago two rats were taken in Liverpool which were infected with bubonic plague.

Bacteriological examination of a dead rat, found in a grain warehouse at the docks, revealed traces of plague. Immediately intensive trapping of rats in the vicinity was begun, and another plague-infected rat was found.

Hundreds of rats which have since been trapped have shown no sign of the plague, and there is no indication that the disease has spread. The investigation was conducted in privacy in order to save the public from alarm. The Minister of Health was informed, the International Health Office at Geneva issued a warning to ports, and a vigorous rat-killing campaign was carried out.

Dr. Frazer said that it was unlikely, in view of the extensive trapping, that any more infected rats would be found. Trapping would continue, but the Ministry was satisfied that there was no cause for alarm. They considered that the danger was over.

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GOVERNMENT TESTING BUREAU OF SHANGHAI

Some particulars of the organisation and activities of the above bureau, of interest to the veterinary profession, are contained in a well-illustrated brochure recently issued by this institution, which operates under the ægis of the Ministry of Industry, National Government of the Republic of China.

In particular, the work of the Animals and Animal Products Testing Department is of interest. This department was opened in 1929 and has as its aim the development of the export trade in animal products. Apart from inspection and testing, which is prescribed by law, the department also undertakes to study and improve animal products for export, to guide and assist merchants in every way (as by the building of slaughterhouses where necessary), to ensure the

[1] See the Report on the Physiological Bases of Nutrition drawn up by the Technical Commission of the Health Committee of the League of Nations.

[2] *Jour. Amer. Med. Assoc.*, 1935, civ., 2144.

quality of their commodities, to inspect the animal products at different ports in the interior, to inspect imported animals and to encourage educational work for the improvement of animal industry. The department is adequately equipped to handle all tests scientifically, the Bacteriological Laboratory having all the necessary facilities for the study of anthrax in hides, bacterial counts in eggs and disinfectants against anthrax and the Chemistry Laboratory for the study of preservation of eggs, analysis of egg products and lard.

There are five important divisions in the department: (1) Eggs and Egg Products Testing Division; (2) Casings Inspection Division; (3) Meat Products Inspection Division (which has concentrated particularly on *ante-* and *post-mortem* examination of pigs); (4) Hides and Skins Inspection Division, and (5) Bristle, Hair, Wool and Feather Inspection Division.

Many animal diseases, such as contagious abortion, contagious pleuro-pneumonia, etc., have been carried into China with imported animals owing to the fact that animal quarantine measures were lacking, and arrangements to remedy this deficiency are about to be put into operation by the Bureau.

The Serum and Vaccine Laboratory started the work of producing anti-rinderpest serum three years ago and since then the demand for the serum has grown to such an extent that it has been found necessary to acquire larger quarters. The veterinarians of the Bureau have done valuable research on the production of an effective vaccine for bovine contagious pleuro-pneumonia and rinderpest vaccine. In regard to the former, an organo-vaccine has been prepared from the diseased organs of cattle by the Laboratory's new method, to be used subcutaneously or intramuscularly, preferably at the gluteal region. Concise information as to treatment of infectious diseases is supplied by mail to remote districts.

Steps have been taken in the last three years to meet China's need for veterinarians by the China Veterinary Education Promotion Committee, which has worked out a scheme under which a Veterinary School has been founded. The School has received a subsidy of two thousand dollars from the Municipal Government of Greater Shanghai as well as contributions from other bodies. Equipment for the School is supplied by the Bureau, while the teaching staff comprises all the veterinarians of the Bureau and Dr. C. C. Wang of the Bureau of Public Health.

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STANDARDS FOR RUBBER GLOVES

The interesting statement is made in the recently-published report for 1934-35 of the Department of Scientific and Industrial Research (H.M. Stationery Office, 3s.) that the British Standards Institution propose to draw up a standard specification for rubber gloves. This will be based upon tests which the British Electrical and Allied Industries Research and the Rubber Research Associations have made upon 150 specimen gloves intended for use by electricians. Rubber gloves for electrical purposes are much thicker than and differ widely from surgeons' rubber gloves. The standards to be laid down for the former will be of little or no value for the latter type. In this connection, *The Pharmaceutical Journal* comments that a standard specification for surgeons' gloves is urgently needed, and the British Standards Institution would be contributing a valuable service if its members produced a specification of minimum requirements for this indispensable protection against infection. In choosing gloves for use in surgical operations it is necessary to know something of their tensile strength, extensibility, the effect of repeated sterilisation, their "tactility" (*i.e.*, their effect on sense of touch), the effects of friction on the surface, and the absence of any soluble matter in the rubber—to mention only a few of the requirements. Probably in carrying out the work needed for the drawing up of a standard specification an elaborate series of tests would be made on the effects of sterilisation by immersion in disinfectants and by heating under pressure in steam. If the results of such investigations were made public we should be in possession of sadly needed information on the ideal method of sterilising surgeons' gloves, a question on which there is an absence of agreement at the present time.

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The centenary of the University of London will be celebrated this year, probably from about June 29th to July 3rd, when many visitors from overseas will be attending the congress of the universities of the empire and the Anglo-American Historical Conference.

Correspondence

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

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COST OF VETERINARY SERVICES

To the Editor of The Veterinary Record

Sir,—In your issue of January 18th, you print an extract from *The Wolverhampton Express* reporting a meeting of the Wellington (Salop) Branch of the National Farmers' Union.

According to this, Major Aston is reported to have alluded to the veterinary staff of the County Council of the West Riding of Yorkshire and to have stated in this connection that over £16,000 was spent in 1934. Although he apparently did not say that this sum was spent by my Department, it would appear that he thought this to be the case.

I do not know where he obtained his figures but I would point out that the sum mentioned is ludicrously exaggerated, for in fact the cost of the veterinary department does not even approach the figure quoted.

The gist of Major Aston's remarks seems to suggest that money is being thrown away on present-day veterinary services and that all that counts is economy. I think it is recognised that up to the present the value of the veterinarian in public health has not been appreciated and that if more money is now being allotted to these services it is a compliment to our work rather than the reverse.

I can assure Major Aston that no hard-headed Finance Committee are going to vote money for new services unless they are quite certain that they, and the public whom they represent, are getting full value for their expenditure.

Yours faithfully,

D. S. Rabagliati.

Veterinary Department,
County Hall,
Wakefield.

January 20th, 1936.

THE GRADUAL EXTINCTION OF THE PRIVATE PRACTITIONER

To the Editor of The Veterinary Record

Sir,—With the advent of a New Year things usually happen, and it would appear that one which the private practitioner may look forward to with every expectancy is, that a good deal of the tuberculin testing hitherto carried out and perfected by him, will, if the owners of tested herds listen to the voices of temptation, be performed by whole-time officers of the Ministry of Agriculture. It was reported in your columns last year, that what was regarded as a most valuable concession in this connection, had been given by the Ministry, in that such testing might be carried out by the private practitioner in co-operation with and *under the supervision of*, one of its officers. I do not regard this as a concession at all, but an insult; and as one who was practically the first, if not the first, to carry out the intradermal test, would like to know what practical experience these officers have—not in performing the test, which is simple in technique—but in its correct interpretation. To suggest that such officers after a short course, are as adept, in this connection, as a private practitioner with years of practical experience, is absurd. The credit for the present-day existence of several tuberculosis-free herds is due in the first place, to the owners of such herds who at great sacrifice have established them, and in not a few cases, too, to the private practitioner who has persuaded them to establish such herds; and secondly, to the Ministry of Health for perfecting the double intradermal test, and making a valuable contribution to the control of tuberculosis. The Ministry of Agriculture, on the other hand, after playing about for the past ten years with a highly ineffective Tuberculosis Order, which has put a premium on "screw" cows and invariably missed the really dangerous ones, *i.e.*, the cows giving tuberculous milk, now come along with a scheme which on the face of it appears an attempted counterblast. It has forsaken the neck of the cow for her vulva for the site of injection and, if given licence, will no doubt shortly proceed to apply the tuberculin by means of a garden spray. For 20 years, the Milk and Dairies (Consolidation) Act of 1915 has been sparsely carried out, many Counties just doing enough to "keep within the law." One of its most absurd provisions, insisting that 48 hours' clear notice must be given to the owner of a herd where the disease is suspected to exist, has satisfactorily ensured, in not a few cases, that the diseased animal, if suspected, is removed beforé the inspector arrives. The Milk (Special Designations) Order, 1923, for Accredited Producers is a masterpiece of confusion.

I have a perfectly open mind with regard to the work which should be and is best done by a competent whole-time veterinary staff, and who can, if they do their work well, educate the herd owner as to the prime necessity of seeking early professional advice in such cases as mastitis, abortion, sterility, and so on; and also with regard to that which is best done by the private practitioner; and I am all for a closer co-operation between all branches of the veterinary profession. However excellent many agricultural organisers may be, I am convinced that their control of veterinary services only leads to friction, and their action in sending whole-time men into districts, or advising that they shall be sent, without the knowledge or consent of the private practitioner, has led to much ill-feeling. In short, the control of matters relating to veterinary science should be vested in and be the sole perquisite of the veterinary profession.

Very soon nominations will appear of candidates for election to the Council of the R.C.V.S., and later in the year to that of the N.V.M.A. I do most sincerely urge on all Divisions and members of the profession, the urgent necessity of putting forward candidates who will definitely pledge themselves to do all they can for those who elect them—"without fear or favour, rancour or rant"—and that the various Divisions should co-operate and ensure the return of such candidates only. These elections have never aroused the interest that they should have done, and the same candidates are returned time after time. However excellent some of the present representatives may have been at the outset of their career, it is only too plain that "age" has mellowed their outlook, and in too many instances they either have little idea of, or care less for, the present-day exigencies of the private practitioner.

Orders are passed without any reference to the veterinary profession and in some cases without its knowledge until they are an established fact. Committees are set up, either with no veterinary representation or with weak, academic, representation. Young, and in many cases, inexperienced graduates are thrust into posts, with the sole qualification of a post-graduate diploma, and are called in over the head of, or put over, a general practitioner with years of practical experience of animals in health as well as in disease.

It is time that the private practitioner, who is vastly in the majority—at present—sat up and took notice, and determined that his representatives should share and guard his views and interests. If he fails, he can with every confidence face early extinction so far as bovine practice is concerned.

Yours faithfully,
J. F. Donald Tutt, f.r.c.v.s.

Winchester.
January 15th, 1936.

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THE PRACTITIONER'S "PLACE IN THE SUN"

To the Editor of The Veterinary Record

Sir,—The time rapidly approaches when certain gentlemen will be nominated for the Council of the Royal Veterinary College.

During the past few years many changes of great importance to our profession have been made, and still more changes are to be expected in the future. While there is no doubt that, correctly allocated, there is ample work for all branches of veterinary science, the practitioner must see to it that he is included in any scheme that may arise, for, in spite of all assurances to the contrary, the practitioner is not receiving the consideration due to him.

Let us, therefore, see to it that only practitioners are returned at the coming election, and more important still, make certain that the men chosen have the courage and determination to secure and consolidate for the practitioner his rightful position.

Yours faithfully,
F. Beckett, f.r.c.v.s.

Berkeley Lodge,
Blandford,
Dorset.
January 19th, 1936.

[Inasmuch as the Council of the Royal College of Veterinary Surgeons is solely concerned with veterinary education, the conduct of examinations and the ethics of the profession, we suggest that a more obvious means of giving effect to our correspondent's desires would be for all practitioners to join the "National" and so "strengthen its arm."—*Editor.*]